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THE
REPUBLIC OF MEXICO
ITS AGRICULTURE, COMMERCE & INDUSTRIES

A Handbook of Information

*based upon exhaustive research work
carried on in the different sections
of Mexico by a staff of experts*

COMPILED and EDITED

By

HERMANN SCHNITZLER

Ph. D., Litt. D.

With Map of Mexico in Colors

NICHOLAS L. BROWN
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CHAPTER I

GENERAL SURVEY—GEOGRAPHICAL SITUATION— INHABITANTS

The United States of Mexico,—Estados Unidos Mexicanos—extend from the $14\frac{1}{2}$ to the $32\frac{3}{4}$ degrees Northern latitude. The northern half of the country, more or less, belongs to the moderate, and the southern half to the tropical zone.

The Republic of Mexico is limited on the north side by the United States of America, on the east by the Gulf of Mexico, on the southeast by the Republic of Guatemala, on the southwest and west by the Pacific Ocean.

The northwest part of the country, *i. e.*, the larger section, belongs to the North-American Continent, and is separated from the southeastern section, which belongs to Central America, by the Isthmus of Tehuantepec.

Each one of these sections has a large peninsula; to the northern part belongs the Peninsula of Lower California, and to the southern the Peninsula of Yucatan.

The Republic of Mexico has $15\frac{1}{4}$ millions of inhabitants; of these 38 per cent are Indians, 19 per cent belong to the white races, and 43 per cent are mixed. The Indians were the original inhabitants of the country; they are represented by many different tribes, the principal of which are the following: the Nahuatlans who number 1,750,000, the Oto-

mians who number 709,734, the Zapotecans who number 580,000, the Mayans who number 400,000, and the Tarascans who number 250,000.

In the geographical-political division of Mexico the following plan is generally followed: First come the States along the coast of the Gulf of Mexico; these comprise the States of Tabasco, Veracruz and Tamaulipas; then the States of the Northern Plateau; these are Nuevo Leon, Coahuila, Chihuahua and Durango; next come the States of the northern Pacific coast, which are Sonora, Sinaloa and Baja California; after these come the States of the central Pacific coast, these are Nayarit, Jalisco, Colima and Michoacan; then the States of the southern Pacific coast, which are Guerrero, Oaxaca and Chiapas; the States of the Central Plateau, Zacatecas, Aguascalientes and San Luis Potosi; then the States of the southern Central Plateau, which are Guanajuato, Queretaro, Hidalgo, Mexico, Distrito Federal, Morelos, Tlaxcala and Puebla; finally there are the States of the Yucatan Peninsula, which are Campeche, Yucatan and Quintana Roo.

In order to facilitate the consulting of this book with regard to the many important matters it contains, we shall always refer to the different States according to their alphabetical order.

AGUASCALIENTES

The State of Aguascalientes is one of the smallest States in the Republic, but it is of considerable importance, and all its enterprises are in a flourishing condition owing to the developed state of its means of communication. In proportion to its area, both its agricultural interests and its cattle industry are more

important than those of larger States whose production is high because of the larger area they occupy.

The city of Aguascalientes, which is the capital, is a very busy commercial and manufacturing center, noted for the embroidery and drawn work made by its women.

The railway workshops are the principal in the country, providing employment to more than five thousand workmen, and its foundry, in which about two thousand are employed, is a most important one.

The area of the State of Aguascalientes is 7,600 square kilometers, with 115,000 inhabitants who devote themselves to agriculture, trade, mining and other industries. It is located on latitude North, 21 degrees and 53 minutes. The city of Aguascalientes has 48,000 inhabitants and is the chief commercial, manufacturing and railroad center in the State.

BAJA CALIFORNIA

The Territory of Baja California covers a long, narrow zone, divided in its central and widest part by a ridge of mountains with wide plains on each side, extending as far as the Pacific Ocean and the Gulf of Cortez. Continuous dry weather, which lasts most of the year, is a normal condition in this region, due to the lack of irrigation, for most of the small rivers of the Territory exist only at the time of the torrential rains which unfortunately are very rare in this section of the country. The extent of the Territory is enormous, but is very sparsely populated, for on an area of 152,000 square kilometers there are only 50,000 inhabitants, that is one individual for every three square kilometers. Notwithstanding this, Baja California is exceedingly rich,

and large fortunes can be made here, as has been shown by many who had sufficient vision and courage to brave solitude, exile, the great inconveniences of a hot climate prevailing here, and all the other difficulties which may be encountered.

It is precisely the enterprising spirit of men of means and energy which is needed in Baja California to completely reveal the immense riches of the country and its ample opportunities for various industries such as mining, oil-drilling and pearl fishing, as well as for agriculture, which up to now has been entirely neglected. The productive potentiality of these lands has been revealed through the gigantic irrigation works of the Colorado river in the National Valley; since then more attention has been paid to the agricultural development of the Territory, for the soil here is excellent and only needs irrigation which is accomplished by damming the rivers and by sinking artesian wells. The section of the Territory called "Valle Nacional," National Valley, can be converted into a region just as rich as that of the Nazas river, with the advantage that irrigation in the valley can be effected by following well-established methods, while in the region of the Nazas river, the so-called Lagoo, it is entirely dependent upon unforeseeable contingencies.

Baja California occupies a large stretch of territory in the extreme northwest of the Republic, starting from the Pulmo and San Jose capes, and extending as far as the most northern points of the country.

CAMPECHE

As will be shown in the various chapters of this book this State offers an ample field for those who

desire to devote themselves to the exploitation of the inexhaustible riches contained in this privileged section of the Mexican Republic. There are in this State immense tracts of land, untilled, but nevertheless, suitable for any agricultural undertaking, such as the planting of the Mexican agave or sisal hemp from which is won the precious fiber known under the name of "henequen," or the cultivation of plants adapted to tropical regions watered by rivers. All conditions in this State are such as to offer many opportunities for the safe and profitable investment of foreign capital, in agriculture as well as in a number of industries, logically originating from the presence of diverse kinds of raw material and aided by modern technical progress. We especially call the attention of the reader to the chapter of Mining Industries. Mention is made there of the rich deposits of copper ore and other minerals existing in the State of Campeche. Industrialists or capitalists interested in this kind of investigation should find it worth while looking into the possibility of the eventual confirmation of what a tradition of several hundred years standing has to say concerning this matter. The climate in the State of Campeche is tropical but quite healthy, especially when care is taken to observe all such hygienic rules as apply to tropical countries in general.

The State of Campeche has a surface area of 46,855 square kilometers. Its population is 57,000, according to the census taken in 1921. This figure, however, is believed to be erroneous, since the census of 1893 gave the State 91,180 inhabitants, and well-informed people think it impossible that after thirty years the population should show a decrease of 34,000. The general belief is that many

villages and settlements situated in the south of the State have not been covered by the last census, due to their remoteness from other centers of population.

The State of Campeche is situated between 17 degrees 49 minutes and 20 degrees 50 minutes of Northern latitude, and between 6 degrees 38 minutes and 9 degrees 48 minutes of Eastern longitude from the Mexican meridian.

CHIAPAS

The State of Chiapas is one of those units in the Mexican Federation which, like Michoacan, could maintain the whole country in comfort, if its immense natural resources were properly utilized.

As a matter of fact, this State is immensely rich, and its industrial and economic awakening is not far off. The railroad, which cuts through it, has shown that it is a region in the highest degree blessed with Nature's best gifts. There exists also, in the main, the spirit of enterprise capable of large undertakings, side by side with the extremely shiftless character shown by several indigenous tribes who live on the bountiful soil of the State; these tribes are the Chamulas, the Lacandones, the Chontales and others.

The forests of the State have a luxuriant vegetation, decidedly tropical, the wooded parts sheltering numerous species of animals of that zone, and there are excellent fish in its rivers. The inhabitants take pride in the best in the Republic for quality. Soconusuco cocoa is superior to the Maracaibo product, while the salt deposits are rich and can be utilized to great advantage.

In truth, Chiapas possesses immense resources, and although it is deficient in means of communication, which is its chief drawback, it could give enormous returns in the parts which are least affected by that deficiency. Not only are there not enough roads in some sections of the State, but communication there is almost impossible, as the pack-animals and those for the saddle are not able to negotiate the roads, for which reason travelers have to fall back upon out-of-date methods of transportation, such as the use of "tamemes" or Indian carriers, who are very strong and know the country and make the most marvelous journeys carrying immense burdens, in some cases equaling or exceeding their own weight. The foreign companies, however, will solve the problem of roads before long, as the finding of petroleum and the sinking of shafts for purposes of drilling for oil, in which Chiapas is rich, will make it absolutely necessary to make the region accessible, and roads will be indispensable for that purpose.

Chiapas has an area of 71,302 square kilometers and some 150,000 inhabitants. It is located in the narrow portion of the country which can be considered as the connection between Mexico and the Central American Republics.

CHIHUAHUA

This State is the most extensive of all the units composing the Mexican Federation. Its soil shows the greatest contrasts, from the most desolate wasteland, with its moving and changeable dunes, to the dales in which the tropical vegetation grows in all its exuberance.

Some sections of the State are very poor, due to

the lack of water, but which by means of irrigation can be converted into incalculably rich land. All the elements necessary to achieve that end are there, for the river Conchos, into which flow most of all the other rivers of the State, carries an enormous volume of water, large quantities of which could be dammed for the purpose of irrigation. There is already, near the town of Camargo, a large dam which holds many millions of cubic feet of water. A little beyond the curtain of this dike the construction of a canal is planned large enough to carry the overflow water from the lake to the section of the country called "Bolson de Mapimi," to the region which forms a part of the State of Durango, passing through portions of Chihuahua, all of which places will be benefited by the water and converted into valuable agricultural lands, especially suitable for the growing of cotton, sugar-cane and grape-vine.

Agricultural industry in this State is already quite important, but it will be so to an even greater extent, as soon as many tributaries of the river Conchos are dammed in, because then many large stretches of land can be utilized for agriculture as well as for pastures.

Chihuahua holds the first place among the cattle-raising States in the Republic. Its cattle, although of small size and little milk-yielding capacity, are so numerous as to offset the disadvantage of inferior quality. Nevertheless, since the stock farmers of Chihuahua are so near to the large farms of the United States, the Mexican cattle raisers have greatly improved upon their stock. As to horses, there are none in the Republic of Mexico which can be compared to those raised in Chihuahua. They are large-sized animals and therefore almost exclusively used in the cavalry of the Mexican army.

The solution of the problem of highways and means of communication will develop the enormous riches of this State.

The State of Chihuahua is, as already stated, the most extensive in the Republic. It measures 233,094 square kilometers. Its population numbers 400,000.

Chihuahua is situated on the border of the United States, by which it is very beneficially influenced, but not sufficiently so, due to the very limited number of inhabitants. In fact, the last circumstance explains why so little progress has been made here.

COAHUILA

This State figures among the most progressive of the Mexican political units and those which have encouraged agriculture most. It has struggled with tenacity in order to modify the conditions of its lands in some sections which were not favorable for agricultural exploitation, while it has taken full advantage of the good land in other sections of the country. Chihuahua enjoys the services of an excellent and very extensive net of railways, and can therefore utilize all its products to the fullest extent. The people of Chihuahua have initiative and commercial valor, and therefore, if more railroads are needed in the State for the exploitation of its riches, they will be built.

All the industries established in the State, agricultural as well as mining, stock-raising or manufacturing, suffer from the scarcity of labor, and for this reason they are not developed to the extent they should be, in view of the riches contained in the soil. But the obstacle to the full progress of the State lies not only in the labor question. There is

also the need of more enterprising men, Mexican or foreigners, who should come to establish themselves in the State, helping to bring about better conditions under which the industries could prosper, and collaborating actively in those already established, in order to obtain from the soil, the subsoil and from the manufacturing of industrial articles an output large enough to satisfactorily solve the problem of supplying the demand of the State with its own resources. Coahuila works in such a way as to make all its efforts productive. It matters not that along with the positive advantages which the different territories of the State offer, there frequently exist negative influences such as area represented by the unfavorable climatic conditions in some of its richest regions; it matters not that besides the wealth to be obtained there are many inconveniences and even hardships that must be endured, because the people fully realize that there is strong competition in all human activities, and that those will triumph who show efficiency in their work.

A spirit of work and industriousness, the noble wish to progress, facilities open to all who come to the State with the idea of finding an advantageous place in the Coahuilan community of enterprise—that is what one who goes there under the noble impulse of striving will find in Coahuila.

The State of Coahuila, in extent the third in the Republic, measures 165,219 square kilometers, with 350,000 inhabitants, most of whom are engaged in agriculture, mining or in the other industries established in the State. It is one of the Border-States, extending for many miles along the border line of the United States, from which it is separated by the Bravo river. Consequently it is situated in the

northern part of the Republic, and is one of the outlets from and to Mexico for commercial and industrial products. The customs-town of Piedras Negras, the annual entries of which never amount to less than \$9,000,000 M. C. (\$4,500,000 A. C.), demonstrates the activity and the magnitude of its commercial operations.

COLIMA

The State of Colima is one of the smallest political sections of the Republic, but it knows how to take advantage of its great natural resources, especially in the agricultural field.

It is situated entirely within the tropical zone, on the coast of the Pacific Ocean. The climate here is fairly hot, vegetation thrives superbly and produces magnificent results. For its development it has the advantage of direct communication with the city of Guadalajara by means of a railroad, and thence with the rest of the Republic. Furthermore, it has a seaport, visited by many ships. Consequently most of its products have an easy outlet. In spite of that at the present time very little progress is noticeable in Colima, due to the same circumstances which of late years have caused a state of stagnancy in the development of several other sections of the Mexican Republic. Nevertheless the inhabitants of the State are beginning to appreciate the great riches existing within the borders of their State, and they have already started several industries which are new to them. Coffee plantations begin to be more profitable and consequently receive better care than the growing of corn, beans and vegetables. Cacao begins also to constitute a profitable industry, and

it is certain that little by little there will be undertaken the cultivation of other products which pay better and yield better results than the old crops.

The existing easy means of communication encourages the establishment of new industries, and there is no doubt that eventually the State will take full advantage of the great wealth with which nature has favored it.

The area of this State is 5,887 square kilometers; its inhabitants number 80,000, most of them farmers. It is situated at 19 degrees Northern latitude, and occupies an angular strip of land, south of the State of Jalisco to the southwest of the State of Michoacan.

DISTRITO FEDERAL (FEDERAL DISTRICT)

The Federal District, the capital of which is the City of Mexico which ranks first among the cities of Mexico as to the number of inhabitants as well as for its architectural beauty, is the smallest political unit in the Republic, since its area covers not more than 1,498 square kilometers.

The chief importance of the Federal District lies in the fact that it is the residence of the high government officials; in fact it is the seat of the Federal Government, consequently within it are located the highest offices with their many branches of activity. Most of the great industries established in the different sections of the Republic, especially the large companies, have their headquarters in the City of Mexico, as the center of information and contact with the principal markets in the country.

The Federal District which in 1910 had about 700,000 inhabitants, has now, according to some, 1,200,000; this is, of course, Greater Mexico, that

is the city itself and the neighboring suburbs included, all of which are connected with the metropolis by a net of very efficient electric tramways. The great political and economic policies of the country are shaped in this small federal state, justly famed for the incomparable beauty of its natural scenery, the sumptuousness of its mansions, and especially for its beautiful climate.

The Federal District is a great consuming center and a first class producer, as will be seen from our statements in the different chapters of this book.

The Federal District is situated in the Valley of Mexico, which forms the southern angle of the Great Central Plateau. Its altitude above the level of the sea varies between 2,200 and 3,000 meters. Its area is a little over 1,400 square kilometers, inhabited now by 1,200,000 people.

DURANGO

The State of Durango belongs to what is called the Central States and has immense natural resources, which only require the advent of capital under peaceful and stable conditions to turn its riches to account. It is essentially an agricultural State and as such gives employment to more than seventy-five thousand men and is, at the same time, the principal mining State in the Republic, possessing the two largest foundries of the country: that of Mapimi and that of Velardena, which yield more than twenty million pesos per annum (one peso is worth fifty cents in American money). It is also a live-stock producing State, and even before the revolution, which has absorbed the energies of the country for the last twelve years, there was a marked

tendency to replace the inferior and degenerated breeds of the country cattle by fresh ones, through either careful crossing or imported stock. The products of agriculture, mining, stock-raising and the forests are to a large extent exported, and this demonstrates that the State can meet its own needs, and at the same time supply other parts of the Republic.

The mild climate, the generally healthy conditions, which are the best in the country, the open-hearted character of its inhabitants and the friendly manner in which they receive foreigners make Durango one of the places particularly suited for an immigration movement that will make it a veritable store-house of wealth and contentment.

None of the other States has suffered as much as Durango in the struggles of the past years, and although devastated by war and revolution, it has yet been able to exist and to keep its resources intact, thus preserving its latent possibilities which will assure its progress at an early date and place it in the front rank among the richest and most prosperous States of the Nation.

The area of Durango is 111,000 square kilometers, with a population of 470,000 inhabitants. It is located between 22 degrees 53 minutes and 26 degrees 28 minutes of Northern latitude, and 3 degrees 45 minutes and 7 degrees 47 minutes of longitude West of the meridian of Mexico City.

GUANAJUATO

The State of Guanajuata is of enormous importance. It has been industrialized to a considerable extent, while at the same time it takes full advantage of the large and important products of its soil.

By many it is considered to be one of the first mining States of the Republic, since it competes with those States which are richer in mineral products. Its mines enjoy historical fame, and as far as production is concerned they entirely justify the high opinion which has always been held of their richness. Guanajuato is also a great agricultural State, and is considered to constitute, together with the States of Jalisco and Michoacan, the great granary of the country, for these three States comprise the well-known agricultural region, called "Bajio," which yields the largest crops of corn, beans and wheat. These grains may not bring the same lucrative commercial returns as do certain products of the tropical zone, but they are nevertheless extremely useful, since they constitute the principal foodstuffs for the poorer classes of the Mexican population, as well as for the rich.

Thus Guanajuato not only is a producer of commodities of prime necessity, but also one of the few States of the country which in many respects fill their own demands. This State has the largest number of towns, with a population of over 10,000. All are devoted to some typical industry, as, for instance, the town of Celaya where the finest sweetmeats are manufactured, the city of Leon with its leather industry, etc. Some of the most important spinneries and cotton mills of the Republic are located in this State which makes the most strenuous efforts to be one of the leaders among the most advanced States, such as Jalisco, Veracruz, Mexico and Puebla. General conditions of peace and tranquillity, confidence in business matters, more railroads, numerous irrigation works which will make the splendid lands of the State independent of the

vagaries of the rainy season, generally abundant and timely, but not always sure—all this is needed by the State for its continued progress, the beginnings of which already exist, due to its great and general tendency towards work and industrial enterprises. The area of this State is 28,363 square kilometers, and its population numbers, 1,000,000. It is situated at 21 degrees of Northern latitude, at a mean altitude of 1,800 meters above sea level. The climate of the State of Guanajuato is mild and healthy.

GUERRERO

This State lies in a region of the Republic which is almost totally unknown and lives abandoned to its own resources. Its mountainous terrain serving as a barrier that separates it from the rest of the country, with a luxurious vegetation, large rivers coursing through the hills, forming numberless waterfalls and cutting their way through the mountains to get an outlet to the ocean, the State of Guerrero has very little hope to acquire what it needs most, namely rapid means of communication which would make it possible to develop its enormous resources and utilize the wealth of its mines and the inexhaustible riches of its lands.

At present there is only one railroad line which touches the territory of Guerrero, but without penetrating far inland: the railroad at Balsas from where a highway has been constructed for the traffic of automobiles between Iguala and Chilpancingo. These means of communication, instead of solving the problem, have rather accentuated it more, and the road opened is only a small artery through which it is impossible for all the dormant life of this

region to circulate, Guerrero being a region as rich as the southern part of Michaoacan and the State of Oaxaca.

The fact that the port of Acapulco on the Pacific belongs to this State does not remove the transportation difficulties, for Guerrero cannot expect to develop and exploit its riches as long as it has to make use of roundabout roads, transportation over which consumes a very considerable portion of the returns, since the maritime freight tariffs are very high, and the inevitable, long delays in reaching the interior of Mexico cause a number of very heavy expenses.

Consequently Guerrero is bound to keep its productive potentiality latent, waiting for the decisive action of the Government and the intelligent co-operation of national or foreign enterprises, which will result in the construction of rapid means of communication, a sure source of future benefits. The area of the State of Guerrero is 65,480 square kilometers, occupied by 560,000 inhabitants. It is situated at 15 degrees latitude North, entirely within the tropic zone.

HIDALGO

This is another State which derives considerable advantage from its proximity to the Capital of the Republic, it being able to count upon an excellent and nearby market for its products.

It has often been considered the chief mining State of the country, although, as we have stated, reliable statistics show that it is the State of Durango which stands first at the present time. Pachuca, the capital, has some very celebrated mines, as are also those of Real del Monte, all of them having

large deposits of silver, gold and other metals. It is also an important agricultural State, and some of the "haciendas" (farms) within its borders make the best "pulques" (fermented juice of the maguey plant) which reach the Capital of the Republic. Its commercial activity is also remarkable. In the section of the Huasteca region which belongs to the State of Hidalgo the same products are obtained as in that of Potosi, and it is expected that it will be greatly benefited by the continuation and completion of the railway line between Beristain (Puebla) and Tampico (Tamaulipas).

The State of Hidalgo contains 22,373 square kilometers, and has 630,000 inhabitants. It is located at 20 degrees Northern latitude.

JALISCO

This is a most important State of the Mexican Federation; in fact, Jalisco claims to be the first State in the Republic. It certainly is so in many respects, and if there were oil in it or at least if oil were being actually extracted from its soil, it would have as much income as the richest of all the Mexican States, that is, Veracruz. No other State harvests as much corn, beans and similar products as this State. The milk production of many States put together does not reach the quantity produced in the State of Jalisco alone, and its commerce, import as well as export, ranks first in the Republic.

Jalisco has begun its industrial activities with unusual vigor, and takes full advantage of the favorable conditions of the present time. Unfortunately the State has not enough means of communication, at least of the kind that gives rapid service. The

road which is being built between the city of Guadalajara and San Blas, where it will connect with the Southern Pacific Railroad of Mexico, will establish direct communication between very rich sections of the country, with the city of Guadalajara as the most appropriate center for their commercial activities. Future railroads to distant settlements in the State, now absolutely isolated, or nearly so, will increase the wealth of the State and will gain and distribute great benefits. In this State is located the city of Guadalajara which ranks second among all the cities of Mexico. In fact everything contributes to making Jalisco one of the most potent factors in the economic and political life of Mexico. It has, furthermore, excellent climatological conditions, it is altogether beautiful and prosperous. Here is also the famous lake of Chapala, to the shores of which the wealthy class of the City of Mexico, as well as those from other parts of the country, come together at certain times of the year, as a special pleasure and health resort.

If to all this we add the open, hospitable, sincere character of the people of Jalisco, their determination to work and their positive spirit of progress we shall readily admit this State to be of the greatest importance.

The area of the State of Jalisco is 86,752 square kilometers, with 1,200,000 inhabitants most of whom are devoted to agriculture. It is located to the West of the City of Mexico, at 21 degrees of Northern latitude.

MEXICO

The State of Mexico is one of the most important in the Republic for the reason that it almost com-

pletely surrounds the Federal District, which in itself is not sufficiently productive to support a population of about 1,000,000 people, and furthermore because it is directly connected by rail with the Capital, and its valleys are fertile and productive.

The principal occupation of its inhabitants is agriculture and industry; some individuals have indeed scored a remarkable success in the above fields. All these branches of activity could, nevertheless, be greatly improved and developed; this also refers to the means of communication in regions where they are of prime necessity.

The cities of Toluca, El Oro, Tlalnepantla, Cuatitlan and others are connected by direct railroad lines with the Capital of the Republic.

The milk industry of the State enjoys a wide reputation and has an excellent market, where there is constant demand for its products.

All these facts give the State a position of high prosperity and one of the brightest possibilities for the future, as long as peace, tranquillity and a spirit of progress furthers the intensification of its activities. The State of Mexico is a first-class exporter of goods and raw materials which mostly go to the Federal District.

The State has an area of 23,909 square kilometers and is inhabited by almost 883,000 people. Its mean latitude is about 19 degrees 18 minutes North. The city of Toluca, the capital of the State, lies 2,661 meters above sea level and is therefore not only one of the highest, but also one of the coldest places in the Republic.

MICHUACAN

The State of Michoacan is one of the richest agricultural States in the country and at the same time one of those which are almost destitute of means of communication that are necessary for the exploitation of its fertile land, which produces varied crops and where many other plants might be cultivated with the certainty of success.

All the plants which at the present time are grown in Michoacan are highly productive, and many of them are so to such an extent that the Republic cannot consume all they yield, as is the case with rice. The rice grown on the "haciendas" (farms) of the Marques Valley (Valle del Marques) alone, which are not the only rice-fields of the State, by far exceeds the national consumption, and there is no certainty of the State being able to export its surplus, on account of the aforementioned lack of transportation facilities.

The problem before Michoacan is that of railway communication and the construction of roads for motor traffic, not for the purpose of increasing production, but simply with the object of using that which the land yields under the present imperfect system of cultivation, and which is sufficient to meet all the needs of the country.

This need of proper means of communication has been particularly felt during the droughts which the country has experienced, such as those of the period from 1887 to 1892, in which years the State of Michoacan, where everything was produced in abundance, could have rendered inestimable services to the Nation, if there had only been the necessary means of transportation. There are also other

problems, such as those of cotton-raising, which Michoacan could easily solve, as the land is very rich and the indispensable element for obtaining good crops, water, is abundant, for the rivers are large and of a permanent nature.

It seems that the farmers in the southern part of the State are seriously turning their attention to the question of making roads, and that they have obtained a concession from the Government for the construction of roads which will start from Uruapan and run to Huetano and other parts. The difficulty, however, will not be completely solved by this means alone, but only lessened; the chief need is railways.

The State of Michoacan has an area of 58,594 square kilometers, and 980,000 inhabitants, and is located in 19 degrees 26 minutes Northern latitude.

MORELOS

This State is one of the smallest in the Mexican Federation, but it possesses great wealth, the exploitation of which is well under way. For many years Morelos has been the principal sugar-producer in the country, not only on account of the extensive production of sugar-cane, which is very abundant, but also due to the important fact that it is situated near the Federal District, which, of course, offers an excellent market for local consumption as well as for export to other sections of the country or to foreign lands of the great variety of its surplus products. Morelos has taken good advantage of this proximity, and although it possesses only one railroad line which runs from Mexico to Balsas, and one branch road from Puebla to Cuautla, it is able to export considerable quantities

of its products. But it could do much more, of course, if railroad lines crossed its small territory which at times is handicapped by insufficient means of transportation.

Morelos is one of the principal purveyors of fruits and timber; therefore, it is to be expected that it will soon be provided with all the facilities necessary for the exploitation of its resources.

The 4,911 square kilometers of the State of Morelos are inhabited by 175,000 people, most of whom are engaged in agriculture, especially in the growing of sugar-cane and the various industries which are dependent upon sugar-cane as raw material.

The State is situated to the South of the Federal District, bordering on the municipalities of Tlalpam, Xochimilco and Milpa Alta.

NAYARIT

This State is one of those unknown regions of Mexico which keep in store enormous surprises. Being cut off by the barrier of the Occidental Sierra Madre mountain chain, it has had little communication with the rest of the country. Its wealth has been little exploited because of the great difficulties in the matter of means of communication. The soil of the State is extremely rich, because it is watered by rivers which have abundant water all the year round and which during the rainy season inundate the country at times to such an extent that the farmers have to go about their fields in canoes to glean their corn. These floods are a great help to the farmer, especially when the soil is scientifically tilled. Its mines, a great number of which have never been

worked, certainly will add in time their portion to that of the other mining States of Mexico, making Mexico the leader among all the silver-producing countries of the world, while it holds a distinguished place among those that produce gold.

Many of the actual problems which the State of Nayarit has to solve will certainly be disposed of as soon as the railroads are built which will connect the State with the city of Guadalajara, and Mazatlan with Durango. By these roads many of the products of Nayarit will be exported.

Although around many settlements and towns an injudicious destruction of forests has taken place, such abuses have now been stopped by the authorities and large tracts of virgin forests are still left, which, if exploited in a scientific way, will undoubtedly yield magnificent results.

There is another source of wealth in the State of Nayarit and that is live-stock raising. Already now there are large numbers of cattle grazing in splendid pastures. There is scarcely any milk industry and the cows are roaming about in perfect liberty, without their milk being utilized in any form.

With regard to this State we have to repeat what we have already said about other States: Nayarit loses much of what it produces, because there is no way to utilize it all, be it agricultural products, fruits of the region, industrial plants and herbs, live stock which produce nothing or scarcely anything. Large quantities of hides of cattle as well as of ferocious beasts such as tigers, mountain lions, etc., etc., are lost every year, because nobody knows how to preserve them.

General progress in Nayarit requires roads, men of enterprise, and labor.

The area of the State of Nayarit is 28,731 square kilometers, with 90,000 inhabitants. It is situated at 22 degrees North latitude, along the coast of the Pacific Ocean. Its population is composed mostly of mestees and quite a number of pure Indians, Nayaritas, Huicholes and Coras.

NUEVO LEON

Although this State has not been very much favored by Nature, it knows how to take advantage of what it has; it is one of the most industrious States of the Republic. It offers a clear proof of what man can accomplish when he is determined not to allow himself to be thwarted by unfavorable circumstances, but rather create the appearance of living in God's privileged country.

Agriculture is fairly well attended to, but it is greatly handicapped by the lack of irrigation. Irrigation works in all rivers of the State, which as a rule do not carry very much water, would make the land a great deal more productive than it is now. Those regions which it has been possible to irrigate are cultivated extensively as well as intensively with the very best of results.

The State is rich, due to the industry of its inhabitants, and because they have carried on their activities with great energy. A large foundry, the largest in the country, casts not only the metals mined in the State, but also those of many other States. Its great brewery ranks second among those in the country, and all its diverse business activities are quite successful. Monterrey, its capital, is very favorably situated and is one of the most active railroad centers in Mexico. The characteristic aim of

the business people of this State is to rank first in their respective fields. The mines in the State are actively worked. Its export and import trade is very active. Finally, Nuevo Leon is one of those Mexican States which try to recover all they have lost during the last long revolution.

Years ago Nuevo Leon used to be one of the first, if not the first, among the States of the Mexican Union.

The State of Nuevo Leon has an area of 54,838 square kilometers and a population of 350,000. It is situated on the northern frontier of the Republic, and is one of the States which have had the good sense to learn from the example set by the neighboring United States in all matters of development and progress.

OAXACA

This is one of the Federal units which is most heavily handicapped by the want of rapid means of communication with the center of the country.

The railroad connecting it with the City of Mexico has been in operation only a few years, and there are still vast sections of the State, which not only have deficient means of communication with the Capital of the Republic, but also with the Capital of their own State. If to this we add the small number of seaports it has, it becomes obvious that the Government must give, as it most certainly will, every possible encouragement to concerns which propose to construct lines of communication traversing the State in all directions, so as to turn to account the wealth possessed by this section, not only in minerals, but also in connection with agriculture, forestry, horticulture, live-stock raising, etc.

Oaxaca is a State which, although bound by ties of common interest to the rest of the Republic, has always been able to maintain itself economically independent to a certain extent, and has a distinct individuality of its own. Its historical traditions and the fact that the ancestors of the present inhabitants were able to successfully oppose the imperialistic designs of the Aztecs, under the leadership of Cosijoesa and his noble son Cosijope, the latter coming to reign in Tehuantepec in order to once for all destroy the domination of the Aztecs who threatened to overrun the South are not forgotten. (Nor are its people unmindful of the fact that the energy and the abilities of the Indian Race were once again demonstrated by a notable Indian of the Tzapotecs.) The peaceful conditions which are daily becoming more firmly established throughout the country, tend to promote the welfare of the State, to recover the vigor of former years and to establish new industries.

The soil abounds in natural resources. If utilized, it can, as is the case in many other States, produce enormous quantities of articles of prime necessity, and furnish raw material for many paying industries which at present are almost unknown in Oaxaca.

There are many reasons why this State should be a producer on a large scale; among them are: a magnificent location in the torrid zone, a large area and a fair number of inhabitants.

The area of the State is 92,443 square kilometers, with a population of 1,000,000 persons. It is located in the Southern part of the country, completely within the torrid zone.

PUEBLA

Due to its proximity to the Federal District, its distance from which is only a few kilometers, and the activity of its business people, the State of Puebla progresses rapidly; it is one of the States that have the most factories.

The Southern Plateau, bounded by the volcanic axis which interposes between the two deep valleys of the rivers Balsas and Panuco, and the extreme points of which are the volcano of Colima and the mountain peak of Orizaba, begin in the plains of the State of Puebla which forms part of the famous Grand Plateau, one of the most fertile of the country. Puebla has regions in the different climates; those near the high mountains are cold; the climate in the high valleys of the city of Puebla, of Tehuacan and Teziutlan is temperate; while the south, Atlixco, Chiautla, Izucar is torrid. There are regions, like that of Chiautla, which present the most varied natural scenery, according to the season of the year; here we have before our view a dead and arid waste, and there a luxuriant vegetation where all animal species of the tropics abound, many of which are quite dangerous, as will be explained in the chapter, "Flora and Fauna."

The city of Puebla, the capital of the State, ranks third among the cities of Mexico. To the North of this city are situated the famous volcanoes, "Popocatepetl" and "Ixtaccihuatl," covered by perpetual snow.

Within the territory of this State are located the principal works of the Necaxa power plant, and this State can boast of the fact that it furnishes electric energy to the Federal District, Hidalgo and Mex-

ico, extending even to places in other States, as for example to Tlalpuahua which belongs to the State of Michoacan.

The great factories of the cities of Puebla and the town of Atlixco strive to keep up with modern methods. These factories, together with those of Rio Blanco, the City of Mexico, and some of Guanajuato and of Hidalgo, supply most of the cashmeres, cloth, fabrics, and blankets used in the country. There are some who think that these national industries if protected by special tariffs would be quite able to compete with similar foreign industries. Puebla is striving toward that end.

The State of Puebla is situated to the Southeast of the Federal District, not far away from it, for Puebla, the capital of the State, lies at 19 degrees Northern latitude. Its area is 33,653 square kilometers, and its population numbers 1,000,000 persons.

QUERETARO

Placed in the center of the country, with many railroad lines crossing it in the direction from North to South, the State of Queretaro can easily be put in a condition to make rapid progress, as soon as there is evidenced a greater interest in industrial undertakings. Several spinning mills and textile factories which are of considerable importance are already operated in the State, but its general activities should and easily could, extend to other fields as well as is the case in the State of Guanajuato, its neighbor on the West side.

Up to now, the principal wealth of the State has consisted in its mines, and one of the typical scenes to be observed at the Mexican railroad stations is

the selling of common jewelry, in the manufacture of which are used opals mined in this State.

The State of Queretaro is of great historical importance, not only because here was fought the last battle of the famous Mexican Empire, Maximilian having been shot on the Hill of the Bells (Cerro de las Camapanas) which is situated near the city of Queretaro, but also because in the same city of Queretaro the meetings of the first independents, under the leadership of the soldier-priest Hidalgo, were held, and finally because the famous Constituent Congress met here in the year 1917 and promulgated the Constitution by which the Republic of Mexico has been governed since.

The area of the State measures 11,638 square kilometers. Its population numbers 243,000 persons who devote themselves partly to agriculture, and partly to the mining industry. The State is located in the center of the Republic, and covers a small section of the valley of the river Lerma and a larger section of the valley of the Panuco river.

QUINTANA ROO

Quintana Roo is called a Territory, because its general conditions are such as not to allow it to number among the regular States of the Republic; for all administrative purposes it depends entirely and directly on the Federal Government. Not much, indeed, can be expected, so far as general advancement is concerned, from an immense area of land having one inhabitant for every five square kilometers. It is a well-known and acknowledged fact that the all-around development of the Mexican Republic requires a large influx of foreign elements,

especially those with capital; this is particularly true in the case of a territory such as Quintana Roo. In fact, this section of the Mexican Union has not even started what could be called development, notwithstanding the circumstances that its general conditions altogether favor the establishment of large foreign colonies. Above all it must be taken into consideration that Quintana Roo is not only a very fertile country, but that it also enjoys the great advantage of being very near the United States, for a three days' trip would take the traveler from any point of the coast to New Orleans, La.; Mobile, Ala., or any southern port of Florida. Most of the soil of Quintana Roo is composed of vegetable mold, consequently it is so rich as to give exuberant growth to whatever seed is planted in it. It is absolutely true that properly organized groups of emigrants, provided with some capital, would find in Quintana Roo a most favorable field for agricultural enterprises, and naturally also for such industries as have to rely on agriculture, and to a large extent on the forests for the supply of raw materials. Everything in Quintana Roo—its forests, its land, its coasts—is still untouched by human hand; strong and willing hands are necessary and awaited to bring forth the most varied and abundant riches. Should the development of the Quintana Roo Territory or of any other section of Mexico be undertaken, there is the assurance that every facility for the purpose will be offered by the Mexican Government.

The Territory of Quintana Roo is situated between 22 degrees North latitude and 18 degrees Southern latitude. It covers an area of 49,914 square kilometers, and its inhabitants number 9,109.

This State is in the central section of the country.

SAN LUIS POTOSI

A large part of it is located in the least favored region of the North, which is known under the name of "Valle del Salado" (Salt or Nitre Valley) and which contains less vegetable matter than the section called the "Bolson," where the soil is rich in vegetable substances and, possessing water, is fertile and capable of giving enormous returns. The "Salado" is poor and can only support poor pasturage. But next to this very poor region there is the "Huasteca" section whose soil is very rich, as is also, although not to the same extent, that in the central section of the State which includes Guadalcázar, Cerritos, Pastora, Rio Verde, Ciudad Fernandez and Santa Maria del Rio.

Agriculture and cattle-raising constitute the basis of the public wealth, next in importance being mining and the various "ixtle" fiber industries which are daily growing in prosperity and which are destined to play a very important and brilliant part in the industrial progress and welfare of the people.

San Luis Potosi has more conditions favorable to its progress than many other States of the Republic, because it is located at no very great distance from the principal cities of the North and the Capital of the Republic. It is cut through by two railroad lines: the Ferrocarril Nacional which extends to Laredo, and the Aguascalientes to Tampico, both of them magnificent routes suitable for export as well as for import trade. It also has oil fields, such as those at Ebano and others which probably are also very rich, especially in the section of the State called the "Huasteca Potosina." The capital of the State, San Luis, is the fourth city in importance in the

country and is a very busy commercial center. The influx of foreign capital is, nevertheless, necessary for the fostering of local industries, which at present are only in their infancy, and for the construction of projected dikes, because these will render immense tracts of land fit for cultivation. This State offers a splendid field for the investment of foreign capital among an eminently progressive class of people.

San Luis Potosi has an area of 62,200 square kilometers and a population of 628,000 persons, of whom more than 100,000 devote themselves to agriculture.

SINALOA

This is one of the States which have succeeded in making considerable headway in matters of general economic development, in spite of their difficulties as regards means of communication with the center of the country. In fact, even now it is easier and less expensive to travel from Sinaloa across the State of Sonora and part of the United States or using the ocean route as far as the port of Manzanillo, in order to reach the central parts of the Republic, than by crossing the Sierra Madre mountain range as far as the State of Durango. Nevertheless, Sinaloa has gone to work; it has begun to utilize the enormous resources of its soil, and is a really prosperous State.

With regard to agricultural wealth, the State possesses enormous possibilities, and as soon as the railroad line from San Blas to Guadalajara and especially that from Mazatlan to Durango is put in operation Sinaloa will be in a condition to develop more rapidly and more advantageously. Considerable quantities of the finest textile, tinctorial, medic-

inal and food plants, excellent timber for construction as well as for cabinet-making purposes abound all over its territory, perfectly watered by large rivers which nearly all run in a parallel direction towards the ocean. Due to this circumstance the irrigation problem in Sinaloa did not have to be solved by the intelligence of men, since it has been amply done by Nature; men only had to build canals to direct the flow of water towards the desired sections.

Live-stock raising has been very well attended to in this State, and the breeds, although home raised, have been subjected to a very careful selection for some time and are of a better class than those in other sections of the Republic.

The mining industry constitutes a rich vein of wealth in this State, and the mines as well as the sands of its rivers contain treasures which are exploited by the inhabitants of the State to the full extent of their abilities.

This State, like the State of Sonora, is a high-minded and active State, always tending to utilize its own resources rather than to appeal to outside aid. Its inhabitants are, as a rule, industrious and enterprising, frank and open-minded, hospitable and courageous.

The State has an area of 71,380 square kilometers and 300,000 inhabitants, mostly farmers. It is situated at the same latitude as the State of Durango in its Southern part, and a little more advanced in latitude towards the North.

SONORA

This State is immense and has enormous natural resources. In size it is the second largest State in

the Republic. In its different regions all varieties of cultivation can be undertaken with every assurance of success. Its location, although very distant from the center of the Republic, is very favorable, because it can send easily and promptly all its products to a sure market: the United States.

The mining industry of Sonora is remarkable and it certainly aims at becoming the first metal producing State of the Republic. As to gold production, if it is not the first among the Mexican States that produce this precious metal, it certainly ranks among the principal ones in this respect, for there is gold not only in its mines, but also in the sands of its rivers, particularly in the region which appears to be the most desolate and desert-like, that is the northwestern section of the State.

The inhabitants are, as a rule, very energetic in business matters, so much so that all their enterprises are greatly progressing.

The definite progress of the State will be decidedly stimulated by the construction of such irrigation works as will free the region situated along the seashore and the territories adjacent to it from the great inconveniences produced by the drought and the lack of opportune rains.

For many years one of the numerous indigenous tribes who live in the rich plains along the Yaqui river has been a serious obstacle to peace and tranquillity in the State, and consequently in the Republic.

Even now the Yaqui Indians do not entirely and absolutely submit to the Government and, after a struggle which has lasted for years, these Indians seem to have an instinctive hatred for all men that belong to a different race from theirs. Once this

serious problem is solved Sonora will greatly profit by the good qualities of these Indians, such as industry and physical strength.

The State of Sonora is on the whole progressing very rapidly in agriculture as well as in live-stock raising and mining industries; in fact, Sonora is one of the most important States of the Republic of Mexico.

Sonora has an extension of 198,496 square kilometers and 250,000 inhabitants. This shows that conditions here are relatively the same as in the State of Chihuahua. Consequently one of the chief problems which the State is called upon to solve is that of populating the region in order to fully utilize the many and varied riches it holds.

Sonora borders on the United States, from where it receives the splendid example of industry and the spirit of enterprise. The territories of the State of Sonora are situated on the highest latitude in the geographical location of Mexico.

TABASCO

The State of Tabasco is, like ancient Egypt, the Daughter of its Rivers! It is located on a marshy soil, furrowed in all directions by innumerable rivers which are very near to one another and which form large swamps and backwaters, lagoons, etc. The land in Tabasco is some 30 or 40 meters above sea level, and is covered with a luxuriant, tropical vegetation which is one of the richest of this part of Mexico. Not a single railway crosses its territory, though there is no need of same, nor would such means of communication be suited to the class of land for it has a marvelous network of rivers, and

the Grijalva and Usumacinta rivers, which comprise all or the larger part of the river system of Tabasco, are navigable for more than 300 kilometers from their mouth.

The sources of Tabasco's wealth are agriculture, live stock and timber. It has no mines, but very rich deposits of hydrocarbons which are about to be developed on a large scale.

The total area of the State is 26,861 square kilometers, in which there are about 170,000 inhabitants, to a large extent devoted to agriculture, the cutting of timber and the gathering of fruit. Mining, as we have stated, is almost unknown in Tabasco, where the only minerals obtainable are copper, mercury, coal, nearly all of which are in the neighborhood of the town of Villahermosa. Here are also deposits of asphalt, which may become an excellent source of profit. The occupations in which the inhabitants now engage pay well, but they could be made still more lucrative. Large loads of freight leave Frontera (port of the State) with Tabascan products which annually amount to many millions of pesos (Mexican currency) as the worth of cocoa alone is more than two millions, "chicle" (sapodilla gum) reaches nearly a half million, and the exportation of woods, fruit, tobacco, hides, rice, skins of tigers, pumas (American lion) and alligators amounts to several hundred thousand more.

TAMAULIPAS

This is another of the prosperous States of the Republic which receive great benefits from their proximity to the United States, through the material example of American working systems as well as

through the American spirit of enterprise and resoluteness. The exploitation of oil fields has brought some benefits to the State, although probably not all it should have yielded, as a result of which the State has always been in a fairly good financial condition and very active commercially.

Being situated on the coast of the Gulf of Mexico, although the conditions of its harbors are by no means favorable, the State derives many advantages from its location which of late has become a new source of income and business activity, for a good many of its inhabitants devote themselves to fishery along the coast.

If to its favorable location and the existence within its borders of hydrocarbons we add its agricultural wealth and its industries which day by day are developing in the proper direction, we can get a fair idea concerning the prosperity of this State.

Another of the advantages possessed by the State consists in the fact that it has means of communication which, though they may not be as plentiful as could be desired, fairly well cover its essential sources of wealth and cross the richest sections of the State. Furthermore, some of its rivers are navigable for many kilometers and constitute arteries of commercial life highly useful for the exploitation of the riches of Tamaulipas.

Its inhabitants are, as in the case of the people of Veracruz, high-minded, determined, enterprising, open and frank, and they preserve their typical customs, in spite of all influences from without.

Tamaulipas is also a stock-raising State making commercial use of its cattle as well as of the by-products of stock-farming. The State follows the best methods of tanning. The textile industry, es-

pecially the manufacture of different articles from fiber, is well liked by the people of Tamaulipas who have made splendid progress in this field.

The area of the State of Tamaulipas amounts to 79,862 square kilometers; its inhabitants number 230,000, most of whom are devoted to agriculture and the industries connected with the extraction of petroleum. A considerable number of persons give their attention to live-stock raising, others to domestic industries, such as the making of ropes and the manufacture of saddles and leather.

Being situated in the northeast plane of the country, on the coast of the Gulf and to a considerable extent along the border of the United States, Tamaulipas is in a condition to develop in every sense, even independently of its petroleum industries.

TLAXCALA

Next to the Federal District, this is the smallest of all the units in the Federation, as even the State of Morelos is slightly larger. It is located, however, at a very short distance from the Federal District, in fact, only a little over one hundred kilometers away, and is in a position to exploit in an admirable manner the products of a soil which, as in the rest of the regions of the Republic, is very fertile and in no respect differs from that of the richest sections of the States of Hidalgo and Puebla. On the other hand, since the land produces the best "maguey" (agave atrovirens), a plant from which is extracted the intoxicating, though at the same time nourishing liquid called "pulque," Tlaxcala possesses an additional great source of wealth, and may be considered a rich State.

The State has an area of 3,974 square kilometers and a population of 180,000 inhabitants, who are mostly engaged in agricultural pursuits. It is located east of Mexico, at a distance of about 100 kilometers.

VERACRUZ

Veracruz is one of the units of the Mexican Republic which are fully conscious of their great value to the economic and social life of the country. A peculiar fact about it is that it has the smallest number of illiterates among its inhabitants, for it has paid the greatest attention to its schools and can boast of the fact that from its Normal School for Teachers has sprung the modern movement of pedagogic reforms which have been adopted throughout the country.

Although situated on the Gulf, it has not been able to accomplish much in maritime industries, due to the inadequate conditions of its littorals which are very low and sandy. Even Veracruz has required very extensive harbor improvements to be serviceable as a seaport. It is the principal seaport of the Republic, and the key to the commercial communication of Mexico with foreign countries.

But what gives Veracruz its present predominant position is the immense number of oil wells of the greatest productivity, as well as those of the greatest potentiality, all located within its borders, as for example the well of Cerro Azul, up to now the most productive oil well in the world and nearly equal to the famous well of Juan Casiano, also belonging to the State of Veracruz and which is already exhausted. Cerro Azul has a potentiality of 250,000 barrels of oil a day. The famous oil camps of

Amatlan, Los Naranjos, Zacamixtle, Tancochin, Ozuluama are also located within this State.

To this enormous wealth must be added the immense agricultural and industrial output of the State which, all combined, make Veracruz the wealthiest State in the Republic.

Anything undertaken in this State soon develops into an enterprise of large proportions. The inhabitants, few of whom are uneducated, know how to direct their efforts toward useful aims, and therefore there is far less poverty in this State than in the rest of the country. There is no doubt that the surroundings in which the people here live and move about, strongly influence the masses, stimulating their energy, making them fully conscious of their worth and impressing a sense of purpose upon all.

The State of Veracruz has an area of 75,863 square kilometers and a population of 1,150,000 individuals. It occupies an extensive region, some 700 kilometers long and from 60 to 120 kilometers wide. The coast is low and sandy, the northern part of which being called the windward or weather shore, and the southern the leeward coast. The largest part of the State is located within the tropical zone; located so near to the ocean, and its land being as a rule very low, the whole State, with the exception of the higher sections, is torrid. Its altitude varies in the different sections from one meter (Alvarado) to 5000 meters (Pico de Orizaba) above sea level.

YUCATAN

The State of Yucatan is essentially an agricultural country; this circumstance makes it precisely

one of the richest States in the Mexican Republic. As we shall see in the chapter on Agriculture, the tilling of the land is a great source of wealth in Yucatan, which, nevertheless, is far from enjoying the degree of prosperity which the State is bound to attain, as soon as certain developments render possible the intensive exploitation of the wealth contained in its soil. This will certainly happen whenever the immigration of healthy and robust elements substantially increases the number of inhabitants dedicated to agricultural pursuits and the influx of capital from without brings about the establishment of new industries based on agriculture, which will supply the most essential raw materials.

Numerous opportunities for the investment of foreign capital are indicated in the various chapters of our detailed description of all the States of the Mexican Republic.

As far as immigration is concerned, we must state that general conditions in Yucatan are favorable to the establishment of foreign colonists of the proper origin or race, provided that they are willing to build a prosperous future for themselves by dint of honest effort and some sacrifice. The principal effort would probably consist in getting accustomed to a new climate, tropical but healthy, in observing a few rules, which experience has proved to be absolutely indispensable in all tropical countries as a safeguard against the most common diseases. There is no doubt that by adhering to such rules, even people from northern countries will accustom themselves by degrees to the climate of Yucatan and attain great prosperity.

The State of Yucatan is situated at 22 degrees

latitude North and 20 degrees latitude South. The area of the State is 41,287 square kilometers, and its inhabitants number 340,000.

ZACATECAS

This State has always been considered one of the principal mining States of the Republic, and since the mining industry has been one of those most affected by the civil wars and revolutions in Mexico, Zacatecas is in a state of considerable decadence. This circumstance, however, does by no means destroy the fact that the elements of wealth of old are still there, consequently it can and will restore its ancient prestige and wealth, as soon as the mines in the State are once more being worked to their full capacity. Some of them, as the mines of Proano, Concepcion del Oro, Veta Grande, Los Tocayos and others are being worked even now, though on a very small scale.

Live-stock raising, another of the great resources of the country greatly damaged by the war disturbances of late years, is actually fighting hard in order to attain once more the rank it used to hold among the industrial activities of the State.

The capital city of the State, Zacatecas, which at a time used to have as many as 50,000 inhabitants, has at present not more than 10,000, and had even less during the dread period of the revolution.

But Zacatecas, as we have already stated, possesses immense riches, at the ready disposal of those who go to its fields, its mines and its towns, to bring the valuable assistance of their capital and energy.

Men of enterprise will find all the incentive they need and wish in the extremely rich mines of the State, in the raising of live stock, for which the

people of the State are especially fit, and in agriculture in those sections of the State, as for example the southeastern, which are sufficiently well watered.

Zacatecas has an area of 63,386 square kilometers and 422,000 inhabitants. It is situated at 22 degrees 47 minutes latitude North.

MEXICAN CONSTITUTION AND ADMINISTRATION

The Federal Constitution of Mexico, according to which the country is now governed, was made on the 31st of January in the year 1917 in the city of Queretaro, capital of the State of the same name; it has been in force since the first day of May of that year.

The States, of which there are twenty-eight, have their own Administration in all interior matters in accordance with State Constitutions, while the two Territories and the Federal District, in which lies the City of Mexico, the Capital of the Republic, are administered by the Central Government.

The Administration in the Federation, as well as in the different States, has a marked personal character. Not only the President, but also every Governor, every Chief of Police, every Judge, and, in fact, every Government Official, wields a great personal influence which must not be mistaken, and which has to be remembered and reckoned with by all such parties as intend to have success in business matters of any kind in that country. Therefore, good personal relations and references are extremely valuable.

The laws of the country are good, but their interpretation and application may greatly vary according to cases and circumstances.

The laws concerning custom-duties and stamp-duties are very complicated. Great care must be exercised not to infringe upon these laws. Those who need or wish complete details concerning such laws, can easily obtain them from any Mexican Consular Office.

LABOR CONDITIONS AND WAGES

Labor conditions in Mexico, in general, are favorable. There are relatively enough workmen in the country for the now-existing extensive industry. Only during the period of the cotton and coffee harvests the help of women and children is needed, and additional working people have to be hired where they can be found, generally in other States or in the towns. Conditions in the industrial districts, in the mines and in the oil-drilling sections are not so favorable. Wages in the country districts are still relatively low, but in the industrial districts, and in the cities they are already quite high and are constantly increasing. In Mexico, just as in practically all other countries of the world, the question of wages has been and is the cause of frequent strikes.

The Mexican Indian, as a rule, is a good and willing worker. He is not much given to economizing, and is content to earn enough to satisfy his needs. But since his needs are few, he does not see the necessity of his working much after he has earned what he considers sufficient for his subsistence. This of course, is a question of education. The Indian, when treated in the right manner, is quite willing to listen to good advice and can be taught to do all the work possible, in order to save and acquire a

good many things of which he knows very little and which nevertheless are indispensable for healthy conditions of life.

Wages are different in the various States and sections of the country. In the agricultural enterprises wages are paid in cash as well as in kind, that is, in both at the same time. In such cases the wages in cash are very low, from 30 to 40 centavos (15-20 cents A. C.) a day.

In the States along the Atlantic coast, in Tabasco, Veracruz and Tamaulipas, farm laborers get, in case they are not paid in kind, from \$0.75 to \$2.00 a day in Mexican money (one Mexican peso—dollar—is worth fifty cents in American money).

On the Northern Plateau, that is in the States of Nuevo Leon, Coahuila, Chihuahua and Durango, they also receive from \$0.75 to \$2.00 a day in Mexican money.

In the Northern Pacific States, that is in Sonora, Sinaloa and in Lower California, they get from \$1.00 to \$2.00 in Mexican money a day.

In the Central Pacific States, Nayarit, Jalisco, Colima, Michoacan the wages range from \$0.75 to \$1.00; for children from \$0.25 to \$0.40; for women from \$0.30 to \$0.40 in Mexican money a day.

In the Southern Pacific States, *i. e.*, in Guerrero, Oaxaca, Chiapas, the farm hands receive \$0.50 to \$1.00 a day. During the coffee-gathering period the women receive as much as \$1.00, and the children \$0.50 a day in Mexican money.

In the States of the Southern Plateau, *i. e.*, in Guanajuato, Queretaro, Hidalgo, Mexico, in the Federal District, Morelos, Tlaxcala and Puebla farm laborers receive from \$0.50 to \$2.50 a day, Mexican currency. In the States of the Yucatan

Peninsula, Yucatan, Campeche and Quintana Roo they get as much as two and four pesos (Mexican currency) a day.

The wages in the town districts, *i. e.*, those engaged in industrial enterprises, receive in the different sections of the Republic about fifty per cent more than those that work in agriculture. The wages in the mining industries and in the oil fields are one hundred per cent higher than in the agricultural activities.

In the port of Veracruz the laborers receive for a day's work of eight hours from \$7.50 to \$9.00 in Mexican money, and in the port of Tampico, where American money is mostly used, they get from \$4.00 to \$8.00 a day.

THE NATIONAL LANGUAGE

Spanish is the national language of Mexico. Nevertheless, English is widely known in the country, especially by business men in the Northern States of the Republic. Of course, to do business in Mexico in an effective way, a good knowledge of the Spanish language is absolutely necessary. This is particularly true when it comes to transact any kind of business with the officials of the different Government Departments, in the Federal District as well as in the States.

CHAPTER II

AGRICULTURE

Agriculture is not very much developed in Mexico, although it has always constituted the principal occupation of the inhabitants of that country. It is claimed that nearly four million people in Mexico are devoted to agricultural industries. Modern methods are employed in some sections and on a number of properties, but on many of the large landed properties and on all the lands which are in the possession of the Indians, the oldest cultural methods are still in use.

The large properties are seldom worked by the owners themselves; most of the cultivated land is in the hands of tenants.

Farmlands are leased on different conditions. The full rent is paid either in money at so much a year for every hectare, or in the form of a certain part of the income, usually from ten per cent to thirty per cent, and sometimes even fifty per cent of the income. In the latter case it is customary in some sections of the country for the owner of the land to provide the tenant with the necessary farm implements, animals, such as horses and mules, and even with some cattle and also seeds; then, whatever the harvests yield, is equally divided between owner and renter.

The highest authority in Mexico in matters of

Agriculture is the "Ministry of Agriculture and Development," headed by the "Secretario de Agricultura y Fomento."

In order to get a complete idea of the agricultural phase of the Mexican social economy, its present status and the inducements agriculture offers to outsiders for a profitable investment of capital, we give in the following pages a complete description of the nature of farming conducted in every section or State of the Federation.

AGUASCALIENTES

Crops.—Aguascalientes being located in the central plateau of Anahuac, at a little over twenty-one degrees of Northern latitude and a mean elevation of one thousand six hundred meters above sea level, its climate is temperate and suitable for the growing of corn, haricot beans, chile, wheat and barley.

The average annual crops are as follows: 60,000 tons of corn, 6,700 tons of beans, 5,000 tons of chile (chili), 340 tons of sweet potatoes, 1,600 tons of barley, 3,200 tons of wheat, 435 tons of Irish potatoes, and small quantities of sugar-cane, peanuts, chickpeas, onions, beetroot, etc.

In consequence of this output which, in relation to the size of this member of the Federal Union with which we are dealing, may be considered fairly high, it produces more than it consumes and therefore sends away a part of its products, it being estimated that it exports more than one-third of the corn and the beans it raises and three-quarters of the wheat, which is shipped in the form of flour manufactured by the large "Douglas" flour mills, so named after their proprietor.

Chickpea or garavance, now little appreciated, peas and sugar-cane on a large scale could be introduced in the State with good prospects of success. The grape-vine could be cultivated in other parts of Aguascalientes, as at present it is confined to the Calvillo section, which does not materially differ from the rest of the State, as it may be presumed that a crop which does well in Calvillo, could be adopted in other parts which enjoy the same climate and possess lands which are of similar composition as regards their vegetable matter.

Transportation.—The transportation lines which the State possesses for moving these crops are: the Ferrocarril Central (Central Railroad) which crosses the whole of Aguascalientes from South to North; the Aguascalientes to Tampico, via San Luis Potosi; the Chicalote branch line and that of Asientos y Tepezala to Rincon de Romos. So that we can consider there are abundant lines suitable for the transportation of the crops to any desired market, within the State or without.

Horticulture and Orchards.—The State has numerous orchards which yield a large quantity of fruit. The following may be mentioned: peach, the mean annual crop of which is 160 tons; quince, 190 tons; pear, 140 tons; "peron" (a kind of apple), 280 tons; grapes, 235 tons; figs, 90 tons; "tuna" (prickly pear), 400 tons; "chabacano" (a kind of apricot), 75 tons; mulberry, 20 tons. The last mentioned is that of the mulberry tree, known in botany as "*morus nigra*." The "*morus latifolia*" grows also very well in the State. The climate is suited for silkworm cultivation, another of the industries which have a brilliant future as soon as business men make up their minds to establish it on

a large scale. The trials which have so far been made, have given very gratifying results, and already the spinning and weaving factories of the State begin to make some use of the local product.

The fruit grown in Aguascalientes would have an immediate market in the towns of the State, but a large part of it is sent away to Zacatecas, San Luis Potosi and to towns in the south of the State.

Both horticulture and fruit culture could be engaged in to a much larger extent in this State. The grape-vine especially is worthy of mention as one of the crops which may be expected to increase in profitability and to extend widely throughout this small State, giving rise to wine-making and the exploitation of its fruit product, as is the case in the States of Durango and Coahuila. The other varieties of fruit can also be improved and their cultivation extended with prospects of good returns, as there are ready markets for them.

Lands.—Although the State is small, it has large tracts of uncultivated land which should be tilled, as they consist of soil of good quality containing vegetable matter. To utilize the lands more fully, irrigation works are needed, to free the farmer from the effects of rain. Along the two rivers which water the State, the Aguascalientes and the Calvillo rivers, there are places at which dams could be constructed to regulate the supply of water to the fields.

Land is not expensive in the State. Uncultivated lands, but adjoining high grade worked lands, can be secured at less than \$20.00 Mexican currency per hectare (2.48 acres). The farmers usually plant corn for their own use (always irrigated crops) as well as wheat; but as far as corn on un-irrigated land is concerned, the owners always farm

out the latter on the share system (a medias) on the same conditions as obtained in the State of Durango and throughout almost the whole of the Republic.

In the State of Aguascalientes there are no lands under the control of the Federal Government.

BAJA CALIFORNIA

Agriculture is not a little neglected in the Territory of Baja California, due to insufficient rains and the lack of irrigation. Nevertheless, in those sections where conditions are less unfavorable, people cultivate sugar cane, Irish potatoes, wheat, cotton, coffee, tobacco, fruits, vegetables, the tinctorial plant of the "orchilla" and other products.

Crops.—Cotton, cultivated especially in the National Valley (Valle Nacional) yields, on an average about 6,000 tons every year, but there will be a much larger output as soon as this plant receives better attention and care. Tobacco yields about 180 tons; sugar-cane, 23,000 tons, of which 1,300 tons are turned into sugar, and another quantity into "piloncillo" (unrefined sugar); Irish potatoes, 370 tons; "cascalote," 980 tons; wheat, 2,300 tons; coffee, 75 tons; "orchilla" (roccella tinctoria), which is employed in the dyeing of silk and wool, due to the coloring reaction of the eritric and recelic acids which it contains in the presence of ammonia. Furthermore, corn, beans, common vetch, chickpeas and other articles are also grown, but in such small quantities that they do not even cover the local demand.

All the cotton, the "cascalote" and other tannin-containing plants, such as the "divi-divi" (caesalpinia coriaria), large quantities of resin, especially that of the "palo de brea"—pitch tree (cercidus

unijuga) which contains seventy-five per cent of resin, are exported.

As far as the introduction of new cultivations is concerned, it is above all necessary that sufficient water be supplied, in order not only to insure the life of the plants, but also to obtain a larger crop. Under such conditions it would be profitable to grow grape-vine on a large scale, since the very dry climate of the region would suit it to perfection, provided it receives sufficient moisture at the roots. The famous hemp-yielding plant, known as "henequen" (*agave rigida*) could be cultivated to great advantage, since it is known that this plant thrives well under conditions prevailing in this territory.

A well-planned irrigation system would allow the introduction of a number of other cultures. It seems that the best practical results in this respect would be obtained from cisterns or artesian wells.

Transportation.—The facilities for the transportation of the crops are essentially of the maritime type, for the Inter-California railroad renders little service, almost exclusively on the border line of the United States.

Horticulture and Orchards.—The fruits grown in the Territory of Baja California yield the following average output per year: figs (*ficus carica*), 250 tons; mango (*mangifera indica*), 600 tons; coquito de aceite—small oil yielding cocoanut (*atalea cohune*), 100 tons; orange (*citrus aurantium*), 760 tons; platano-plantain (*musa paradisiaca*), 300 tons; dates (*phoenix datilifera*), 230 tons; sandia—watermelon (*cucumis citrullus*), 400 tons; toronja—grapefruit, (*citrus decumana*), 200 tons; lima-limes (*citrus limetta*), 45 tons; melon—melon (*cucumis melo*), 80 tons; grapes (*vitis vinifera*), 125 tons.

Nearly all these fruits are exported. Fruit-growing would be one of the easiest sources of income, if the problem of irrigation were properly solved by means of a large number of artesian wells. The nearest and best market for everything produced would be the United States.

The same drawback exists in the matter of horticulture; the lands need irrigation, and after that is introduced the Territory will produce all it wants and have a good surplus for export.

Lands.—Since only a very small section of land is cultivated, we may safely state that the entire Territory is a vast uncultivated region. The land tilled is only an infinitesimal part of that which could be exploited, provided, of course, as we have repeatedly said, that water be procured not only for the plants, but also for the inhabitants and the animals employed in agricultural activities. At present the cultivated land is found around the more thickly populated centers or towns, as La Paz, Todos Santos, Mexicali, Mulege, San Jose del Cabo, etc. There are extensive tracts of land which could be utilized, preferably for plants that require a very dry atmosphere, such as cotton, the grape-vine, sugar-cane, and all such plants as consume great quantities of water. Landowners sell their land at very low prices, since the hectare does not cost more than \$15.00 (\$7.50 in American money).

The Federal Government is the owner of vast tracts of land in this Territory, in the Southern as well as in the Northern District, into which the Territory is divided for the more convenient administration. The following lands can be leased from the Government: the lands that were comprised within the concession given to Mr. Adolfo Bulle for

the object of colonization, *i. e.*, 702,268 hectares; those included in the concession to Mr. Pablo Macedo, also for the sake of colonization and which aggregate 2,488,335 hectares; the lands comprised within the concession made in favor of Messrs. Flores Hale & Co., *i. e.*, 1,496,455 hectares. These concessions had been solicited with the previous knowledge that such uncultivated areas of land really existed, and were declared null and void a few years ago.

CAMPECHE

Crops.—The Mexican hemp known as “henequen” is the principal article grown in the State for exportation. Up to four or five years ago the crops of hemp in this State would yield as much as 60,000 bales a year, each bale weighing 173 kilograms. But since then the exportation of the fiber has diminished considerably due to the low prices at which this article has been quoted on the American market, to which practically all is shipped.

The articles grown, besides henequen or sisal fiber, are corn, beans and rice. As far as output is concerned corn constitutes at present the principal product of the State; after that come beans and finally rice. The rice is of a superior quality, but the difficulties of harvesting the grain in a country where labor is very scarce is the principal reason why its cultivation is not so extensive as it should be. The corn grown in this State is also of the finest quality. The grain, being small, floury, very hard and healthy, keeps well and is not affected by vermin. Six different kinds of corn are grown in this section of the country, one as excellent as the other. Young

species of two or four months growing are planted at the same time of the year as a measure of precaution. The production of this grain satisfies the demands of the local market, and leaves a surplus for exportation to the neighboring State of Yucatan. Sometimes it is exported also to the Mexican port of Veracruz, whenever corn is scarce in that section of the country, causing a considerable raise in the prices. It is claimed that the excessive maritime freight is a serious obstacle to the increase of exportation of corn from Campeche to the other sections of Mexico. Figures available up to the publication of this book estimate the year's production of corn at 80,000 hectoliters or probably more, because the lack of interest in the production of the sisal fiber has caused the small farmers to plant corn instead of henequen. The soil of Campeche produces also a very good class of tobacco, and there is no doubt that the cultivation of this article on a large scale would yield most excellent results. The planting of coffee trees has been tried in this State, and there seems to exist every reason for extending the cultivation of this tree.

Transportation—For transportation the State has the services of some railroad lines, but in the main it depends upon the maritime routes along the coast and on ordinary cart roads in the interior of the State. These roads, especially during the rainy season, are not always in the best of condition, but the State Government seems to be giving its fullest attention to this very serious matter, for the promotion of agricultural enterprises in the State.

Horticulture and Orchards.—The cultivation of garden vegetables is done to some extent; an excellent Irish potato is produced. Between the rows

of corn, sweet potatoes, pumpkins and "jicamas" (a vegetable similar to the pumpkin) are nearly always planted in sufficient quantities to cover the needs of the State. By the aid of proper irrigation a number of parks and gardens have been laid out all around the town of Campeche, where all kinds of vegetables are grown. Especially do they produce a fine variety of tomatoes which grow in very large quantities, but most of which perish, because nobody thinks of packing and shipping them to a market. The Indians usually cultivate their own land, on which they grow chile, tomatoes, peanuts and several varieties of melons. There is here a kind of melon called "valenciano," which as to flavor and taste is one of the most delicious fruits known anywhere. Campeche is doubtless a privileged country for the growing of fruit; not only do all those fruits grow here which are peculiar to the climate, but they are also all of an especially delicious aroma and delicate taste. A variety of oranges called "china," as well as the lemon that grows in this section, are bound to become important articles for the export trade, as soon as the people understand the commercial importance of cultivating these two fruits on a large scale. Mangos of all known varieties grow in this State, from the very small one known in this part of the country under the name of "montecristo," to the large mango, called "manila"; all these mangos grow in very large quantities and should certainly constitute an article of exportation. Among other delicious fruits that grow in this region are the red mammee, the sapodilla-plum, the common sapota, and the black sapota, called "tauch" in the Indian language, the "guanabano," a kind of anona, the "saramuyo," the anona. There is also a great va-

riety of alligator pears, all of most excellent taste; then there are the "caimito" and the "nance," a fruit which, preserved in alcohol, would probably be a good article for the export trade. There is no doubt that the scientific cultivation of fruit in this State would be an excellent industry, provided proper irrigation were introduced to avoid failures which the extreme dryness of the soil might cause. But this very dryness, remedied by the rainy season and proper irrigation, is precisely what gives the fruit of these regions its peculiarly delicious taste and such an agreeable aroma. The cultivation of fruit trees requires no preparation of the soil in this section of the Republic; all the work consists in planting the little tree, watering it during the dry season, and keeping it free from adventitious herbs or growths during the rainy season.

Lands.—Very little of the land which belongs to this State is cultivated. It may be safely said that only the section along the coast is inhabited, the vast extent of the interior of the State being entirely uninhabited and uncultivated. Any amount of land can be had in this State, the principal owner of which is the Federal Government. The extent of free land in the Districts of Los Chenes, Champoton and El Carmen is enormous. The level part of all these lands can be planted during the rainy season; not so the mountainous sections. The valleys are generally swampy, but a good system of drainage would convert them into splendid agricultural land. High land of rich soil with deep aquiferous layers is found in the District of Los Chenes; low land, poor but with sufficient water supply is in the District of Hecelchakan. All the land around the capital of the State is good, having plenty of water

near the surface; but far better land with better water supply is that found in the District of Champoton. In the District of El Carmen the land is composed of pure vegetable matter, and the natural water system there is as extensive as in the neighboring State of Tabasco. The special conditions of the different tracts of land indicate sufficiently what should be planted. Thus, for example, in the District of Hecelchakan and partly in the District of the Capital the cultivation of the sisal fiber is to be preferred. Splendid sugar-cane grows everywhere in the State, but the frequent droughts shorten its life, which as a rule does not exceed seven years. The establishment of a system of irrigation would certainly increase the vitality as well as the production or quality of the plantations.

It is customary among the important landowners to rent out any portion of land for one or two years at ten per cent of the production of the cultivated area. Federal laws now ruling do not permit foreigners to obtain land within a certain distance from the seashore, or from the borders of the Republic with a neighboring country.

CHIAPAS

Crops.—Agriculture is the field in which the State of Chiapas has the greatest natural advantages. Its soil is suited to every kind of cultivation, and legends tell us that the primitive nomads found corn here in its wild state. Being a State as well watered as Tabasco, with permanent and abundant streams running through its territories, all the crops grow well, and one can obtain here three and even four crops a year. The products which are chiefly grown

in this locality are the following: rice of excellent quality and which is mostly shipped to towns of Central America and to various other sections of Mexico; of this 3,000 tons are obtained on an average every year, it being interesting to note that it is not intensively grown, nor is all of the product utilized to the fullest extent; cacao (*theobroma cacao*), which in addition to chocolate, with which sugar and vanilla, etc., is mixed, produces cocoa-butter, powder, wine, fiber, etc. In the Soconusco section which is famous for this valuable product, more than a thousand tons a year are obtained, almost all going to other parts of the Republic or to foreign countries. Coffee (*coffea excelsa*) produces 12,000 tons a year, and is exported both to the interior of the Republic of Guatemala and Salvador. Sugar-cane gives excellent returns, and although it has been much neglected during recent years, it produces more than 240,000 tons, without counting that which is made into sugar in the sugar mills, and that which is used in making "panocha" (a coarse kind of sugar) and molasses. Sugar amounts to about 1,000 tons, panocha yields about 5,600 tons, and molasses 3,000 tons a year, which is used partly for domestic consumption and partly for export. Corn is an article which is cultivated extensively, and Chiapas is one of the States which produces the largest quantity of this article, its crops reaching on an average 345,600 tons a year, about 250,000 tons or over being shipped to countries of Central America and some to the States of Campeche and Yucatan. Beans yield 20,000 tons a year, mostly consumed in the domestic market. Tobacco is another crop suited to the rich and well-watered lands of Chiapas, and although so far it has not been cultivated with

the proper care, it produces some 1,300 tons a year, part of which is turned into a finished product in the State and the rest is shipped to the large factories in the center of the Republic. Rubber (*castilloa elastica* and *ficus elasticus*) is extremely abundant in Chiapas, but it is very little used industrially, only about 200 tons being gathered annually, which is a ridiculously small amount, considering the immense number of rubber trees which grow in the State. There are "haciendas" (landed estates), such as the Hular del Suchiate, where the rubber-tree is regarded as a parasitic growth, but this is because it is not made use of in the manner which the large number of trees and the utility of preserving the forests would warrant. We must draw attention to the fact that the figures given are only those of the quantities which are turned to account. The productive capacity of Chiapas is unlimited and could easily be increased tenfold without exhausting the land. Every kind of productive crop may be introduced. "Pochote," or cotton grown on large trees, which form whole forests here, is not utilized in any manner whatever, the entire natural product being lost. It may be truthfully said that Chiapas would allow of any kind of cultivation desired, as it has very fertile soil, containing a large amount of humus, and as it is well watered by the rains and the large rivers of the State, it is only necessary to construct small irrigation canals to direct the water to the desired spots. Chiapas is, we repeat, a splendid field for enterprising men who desire to see their efforts crowned with the most gratifying success. Any effort in Chiapas will be rewarded, with interest.

Transportation.—For transporting the crops the following lines are available at present: The Pan-

American Railroad which, starting from San Jeronimo in the State of Oaxaca, crosses Chiapas to Mariscal, the terminal point of the road on the banks of the river Suchiate, and whence the line will be continued through the Republic of Guatemala and the other Central American countries; the branch line to Puerto Bonito; a branch to Puerto Arista, starting from the town of Tonola. Furthermore, the State has navigable rivers, such as the Grijalva which is navigable for more than a hundred kilometers within Chiapas territory, and the Usumacinta river navigable for about 140 kilometers. Many of the tributaries of these rivers also are navigable for launches, small steamers, etc. Lines for rapid traffic will have to run across the precipitous mountain range called "Sierra de Huietepec," one of the most difficult to traverse, located in the region which is washed by the waters of the Pacific.

Horticulture and Orchards.—It seems almost unnecessary to state that the State of Chiapas produces all kinds of fruits; not only those of tropical climates, but also fruits of other climates, for which admirably suited conditions exist. Notwithstanding, however, the astounding quantity of fruit which can be obtained by simply stretching out the hand, the following average annual quantities constitute all that is being turned to account: aguacate (alligator-pear), 2,300 tons; peaches, 870 tons; guava, 6,700 tons; jobo (tree of the terebinth family), 1,300 tons; "jicama" (a tuber), 1,500 tons; limes, 3,000 tons; apples, 1,000 tons; "nanche," 2,300 tons; pineapples, 1,600 tons; oranges, 4,500 tons; bananas, 4,800 tons; and an endless variety of other fruits. The figures given refer to exports exclusively, as local requirements cannot be estimated; the State of Chiapas

produces many times these quantities. Fruit culture therefore is solely a question of using what there is, without bothering about increasing the yield. The same thing may be said of horticulture, the products of which have no outlet at present, owing to the lack of shipping facilities that would make it possible to get the products to market at the proper time.

Lands.—Throughout the State there are large areas of land which, though not unproductive, are not utilized for the production of articles of prime necessity, and are therefore useless, as the natural products are allowed to go to waste. The holders of landed estates seldom sell their lands, though they will rent them or farm them out on a partnership basis. For what land there is to be purchased, the price is ridiculously low; less than 50 pesos (25 dollars) the hectare, including the timber.

In Chiapas there is a considerable area of national land, that is land which can be obtained from the Federal Government. Among these land reserves may be mentioned Cerro de Piedra, 3,000 hectares; La Trinidad de Chimalapa, 11,000 hectares, and other lands which in all would probably exceed 300,000 hectares, which the Federal Government could sell or rent out.

CHIHUAHUA

Crops.—Taking into consideration the extent of this State, it produces little of agricultural products. Cotton yields ridiculously small crops, although the conditions for its cultivation are in this State the same that prevail in the States of Durango and Coahuila. In matters of agriculture the people of Chihuahua give preferential attention to the raising

of sugar-cane, peanuts, corn, beans, barley, wheat, tobacco, some vegetables and fruits. One of the principal things that hinder agricultural development in the State is the scarcity of labor, for this is a very thinly populated State, considering the number of inhabitants per unit area. Under the circumstances no progress can be expected in the development of agriculture.

Cotton (*gossypium herbaceum*) yields about 600 tons every year, all of which is used by the weaving and spinning industry of the State itself. Peanuts yield 800 tons, mostly consumed in the State. They are toasted, but not as yet utilized for the making of oil, which, if engaged in would yield very good results. The sugar-cane produces about 2,000 tons a year, not counting the cane used for the making of "piloncillo" (crude sugar), amounting to 400 tons; and molasses, 100 tons; corn (*zea mays precox*, preferably, and *zea mays turgida*) yields 160,000 tons; beans (*phaseolus vulgaris*), 15,000 tons; potatoes, 5,800 tons; "cascalotte," 230 tons; wheat, 34,500 tons; barley, 140 tons; cabbage (*brassica oleracea*), 290 tons; chile (*capsicum annum* and the variety known as *capsicum cordiforme* and to some extent the variety called "tornachile," (*capsicum longum*), 500 tons.

Of these crops the State exports about 26,000 tons of wheat, generally in the form of flour; 38,000 tons of corn; 2,700 tons of Irish potatoes; 300 tons of peanuts; 200 tons of tobacco; 4,000 tons of beans; 230 tons of lentils (*lens aesculenta*) and small quantities of the other products.

Chihuahua is one of the regions most suitable for agricultural enterprises, and it will certainly progress rapidly in that direction as soon as the irriga-

tion works, which have already been started on a gigantic scale on the river Conchos and in various other parts are finished.

The cultivation of common rye, and chickpeas, must be introduced and that of cotton can be enlarged to an unlimited extent, for the section of the Bolson region which belongs to this State, is very extensive and can be irrigated, partly at least, by means of irrigation works similar to those that have been planned for the Chihuahua river. The cultivation of sesame could also be introduced. Cotton should be cultivated preferably in the eastern section of the State, and the other articles in the central part of it.

Horticulture and Orchards.—Comparatively little fruit is produced in this State. The average yearly crops are estimated as follows: "chavacano" (*prunus armeniaca*), 230 tons; peaches, 7,600 tons; figs, 340 tons; apples, 500 tons; melons, 700 tons; quinces (*sydonia vulgaris*), 1,200 tons; oranges, 1,600 tons; nuts (*juglans regia*), 300 tons; pears, 3,000 tons; "tejocote" (fruit resembling a sloe—*crataegus mexicana*), 400 tons; watermelons, 4,000 tons; grapes, 500 tons.

Small quantities of this fruit are exported to the United States.

Fruit culture could be profitably enlarged in the State of Chihuahua, in the proximity of the rivers. The same applies to horticulture, for the simple reason that a splendid market, the United States, is nearby.

Lands.—Chihuahua is the State that has the largest tracts of uncultivated lands. Although very rich and entirely fit for intensive cultivation, these lands up to now have been utilized only for cattle-

raising; but even this industry, although very extensive, cannot make use of all the land yielding pasturage. There are stock-farms in this State larger in area than one of the middle-sized States of the Republic, and the only portions of this vast area that are cultivated are those around the settlements of the farms. The lands of the central valleys are suitable for the cultivation of all those articles which are consumed in the country; the lands of the Tarahumara valleys are good for the cultivation of the plants peculiar to the torrid zone, while those of the Bolson region, if systematically irrigated, can be utilized for the cultivation of cotton, sugar-cane, vine, watermelons, melons, etc.

Among the farmers of the State there is little demand for land, although a movement has been started by the Government to induce the farmers to become the owners of the land they cultivate. The proprietors of landed estates sell land at low prices, in fact at less than twenty pesos the hectare, *i. e.*, ten dollars in American money. Land tenure exists on the basis of partnership.

The Federal Government possesses large tracts of land in the State of Chihuahua; in the region known as the "Picacho" it can dispose of 8,200 hectares; near Ciudad Juarez of 35,000 hectares; in Satiapachic of 4,000 hectares. The Government, furthermore, has canceled the concession given to Mr. Antonio Penafiel and Mr. Inigo Noriega for the colonization of 300,000 hectares in this State; all these lands can be had from the Federal Government.

COAHUILA

Crops.—The wealth of this State, private as well as public, is based on agriculture. Cotton is pro-

duced here in about the same quantity as in the State of Durango. The large cotton plantations in both States follow the same methods, use the same sources for the irrigation of their lands, that is the inundations of the Nazas river, which occur at certain regular intervals as those of the Nile. The great cotton planters have to regularize the course of the Nazas river by means of damming it, in order to protect themselves against the caprices of Nature. There are many cotton plantations in the State, the principal of which are those of Hornos, which is immense, Peru, La Perla, Santa Teresa, Vega Larga and others. There are also plantations which specialize in growing sugar-cane, others that grow chiefly corn, and there are large live-stock farms. Of the others, we may mention the Hermanas plantation, which cultivates sugar-cane and corn; the San Carlos plantation, which grows corn; the Guadalupe plantation, which raises wheat and corn; Moral, raising corn; Alamo and Encinas, raising corn; Cienega de Flores, growing wheat; Colon, El Aguila, El Marques, La Cruz, which specialize in corn. The farms which are situated around the town of Cuatro Cienegas cultivate chiefly grape-vine.

Thus the cultivations specialized in by the farmers of Coahuila are: cotton, of which on an average 23,000 tons are obtained every year; sugar-cane, which gives 6,000 tons; rice, 480 tons; barley, 5,400 tons; beans, 5,800 tons; chickpeas, 570 tons; watermelon, 1,700 tons; corn, 56,000 tons; wheat, 28,000 tons; and considerable quantities of other vegetables, such as beet-rave, calabash, onions, tomatoes, etc.

These crops represent more than the State consumes; as a result, one-third of the output is shipped out of the State, with the exception of cotton, almost

all of which is exported to the different factories of the country, for the few factories in the State can use no more than 2,000 tons. Corn and beans are also an exception, for scarcely any of these vegetables are exported; on the contrary, the State must even import both articles from the States of San Luis Potosi and Durango.

The melon crop is very abundant, not less than 3,200 tons a year. The watermelon is consumed in the warmer sections of the State, *i. e.*, Torreon, San Pedro, Monclava, Piedras Negras and other places; but quantities are sent also to the cities of Monterrey, Tampico, Laredo, Ciudad Victoria and others.

One of the cultures that could be advantageously introduced in the State, is that of the white-mulberry tree (*morus latifolia*), especially in the region of Torreon and Parras, along the Aguanaval river. The castor-oil plant (*ricinus communis*) could also be easily acclimated in this region and would yield large crops.

Transportation.—In order to move its crops the State of Coahuila possesses the best railroad system, having about 3,000 kilometers of railway, the largest part of which is the International Railroad from Piedras Negras to Torreon and Durango; then there are the branch lines of this road; the Coahuila and Pacific line with several other branch lines, and several other lines. Thus the crops can be easily taken to the different sections of the State and the Republic and to foreign countries.

Horticulture and Orchards.—The average yearly fruit crops in the State of Coahuila are the following: quinces, 980 tons; peaches, 640 tons; pomegranates, 180 tons; figs, 830 tons; apples, 360 tons;

peron (kind of apricot of a specially fine kind), 700 tons; pears, 190 tons; grapes, 2,600 tons.

Most of this fruit is consumed in the State, some of it is sent out, especially to the splendid market of Monterrey and the towns in the vicinity of Tamaulipas, and even to the United States. Most of the grape crop is utilized in the State by the well-known and flourishing wine industry, as for example the wine presses of Mr. Ernesto Maderos in Parras, of Mr. F. Arredondo Cepeda in Cuatra Cienegas, where there are other concerns which make brandies of the best quality.

Horticulture must be better developed in order to fill the existing demand in the State itself, and to supply other markets, of the State of Nuevo Leon especially. Fruit-growing also needs special attention; it certainly would have a splendid market in the State of Nuevo Leon and the United States.

Lands.—The State of Coahuila is remarkably large, but not all of its land is utilized for cultivation. One-fifth of its area, if not less, is now used, not because the untilled lands are unfit for cultivation. On the contrary, all the land is of excellent quality, and that of the Bolson section is equal or even superior to the cultivated areas. Excavations made in the remotest parts of the desert have shown that land to contain vegetable mold to the depth of more than ninety meters, and this seems to strengthen the belief that Bolson represents the valley or bed of a lake which during centuries had been the recipient of the slime of the rivers Nazas and Aguanaval, the remains of which are the lagoons of Parras and Mayran, into which still flow the few currents which it has not been possible to dam for the irrigation of the cotton fields. Thus

water reaches the latter only during the heavy rains and the subsequent inundations of the rivers. All the land adjacent to that which is now cultivated deserves attention, and it surely will receive it as soon as the dam is constructed on the Nazas river in the Fernandez canyon, in the State of Durango, for the purpose of which twenty-five million pesos have been appropriated, the sum including indemnities to the owners of rural or urban properties which may be damaged by the backwater. We should also recommend derivation works on some of the rivers, such as the Conchos and the Florido which flow into the Bravo without sufficiently benefiting the adjacent lands. Any amount of money spent for such a project would be redeemed a hundred-fold by the gaining of immense tracts of land especially suited for the planting of cotton, grape-vine and sugar-cane which would thrive splendidly in this climate.

The system of land tenure in this State is the same which is in use all over Mexico: the right of exclusive ownership of all products which yield a great deal for the consideration of a certain rental; of course half and half ownership in the case of corn and beans grown during the wet season, for the irrigation is controlled by the owner of the land. In the cotton belt of the lagoon a section of land for the cultivation of cotton is worth from 70,000 to 100,000 pesos, and the annual cultivation costs between 20,000 and 25,000 pesos. In other sections of the State it is not difficult to buy land, especially in those parts where cultivation is not so very easy; here the prices are very low. The landed estates of the Bolson are enormous, and constitute the largest in the country, scarcely surpassed

even by those of the Terrazas family in the State of Chihuahua, and possibly by one or two in the Republic.

It is precisely the circumstance that the estates in Coahuila are very large and that they are still managed according to methods in use since the conquest of the territory by the Spaniards, that gives rise to the belief that there are many surplus lands which, after the real boundaries have been fixed, will be declared national property that can be had from the Federal Government. It is not quite certain whether there are other national or federal lands in the State of Coahuila, although it is probable that there are none, especially in those sections where facilities for agriculture exist.

COLIMA

Crops.—The agricultural products to which the people of Colima give most of their attention are: sugar-cane, coffee, cocoa, rice, sweet potatoes, corn, beans, tropical fruits, etc.

Sugar-cane yields on an average about 23,000 tons every year, of which 2,400 tons are turned into sugar, 475 tons into crude sugar and 1,800 tons into molasses; this means that Colima produces less sugar-cane than the State of Morelos which is somewhat smaller than Colima, the conditions of both States being about the same.

The present production of coffee is 400 tons; it is of very good quality, although not valued as highly as the coffee from the Uruapan district which is not far from Colima. "Cascalote" gives about 300 tons. This is a plant the fruits of which contain thirty per cent of tannin, and for this reason it

is of great industrial value. Sweet potatoes (*ipomoea batatas*) produces about 680 tons; corn, 95,000 tons; beans, 6,000 tons; onions, 200 tons; tomatoes (*licopersicum aesculentum*), 300 tons; the green variety of tomato (*physalis peruviana*), 100 tons; lentils, 150 tons; cucumbers (*cucumis sativus*), 80 tons; carrots (*daucus carotta*), 50 tons; rice (*oryza sativa*) produces 2,800 tons.

Of these crops more than half is shipped into the interior of the Republic or to foreign countries.

There are many other articles which could be grown in this State; sesame, so well attended to in the States of Guerrero, Michoacan and Jalisco, would bring wonderful results in the State of Colima; cotton, the castor-oil plant, the ramie fiber and other plants would do equally well.

Transportation.—For the moving of its crops the State has the services of the railroad from Guadalajara to Manzanillo and of the steamships (coastwise vessels as well as ocean liners) that touch at Mexican ports in the Pacific.

Horticulture and Orchards.—All tropical fruits grow in this territory: oranges, of which about 400 tons are harvested every year; guavas, which yield about 200 tons; red plums (*spondias purpurea*), with an average yearly crop of 100 tons; yellow plums (*spondias lutea*), with an average yearly output of about 80 tons; yellow sapote, generally called "zapote borracho" (*lucuma salicifolia*), 50 tons; purple plantain (*musa rosacea*), 100 tons; limes (*citrus limetta*), 60 tons; "chicozapote" (*achras sapote*), 75 tons; coconuts, 1,400 tons; "pitahaya"—fruit from the cactus-tree (*cereus tricostatus*), 200 tons; watermelons, 80 tons; etc., etc. All these quantities must be understood to represent the quan-

tities that are exported from the State, mostly to foreign countries.

There is scarcely any reason why the growing of fruit should be extended in this State, since not even that which is now harvested, is properly exploited for commercial purposes. As to horticulture we must say that, since the lands in the State are excellent for the purpose, a great deal more could be gained from them than is the case now, especially since there is a sure market for all the vegetables that could be produced.

Lands.—There are in the State, particularly in the northern and eastern sections, great tracts of uncultivated lands, which are now occupied by forests but which could be devoted to more lucrative purposes. As to the most appropriate articles to be planted, there is no need to repeat them, since we have already clearly explained what the State yields in the agricultural field. A more extensive cultivation of the land would, nevertheless, require irrigation works on the Armeria river which crosses the central part of the State as well as on the Cohuayana and other rivers. Such irrigation works would make especially profitable the planting of rice, sugar-cane, cotton and tobacco. It would also be good to extend the breadfruit trees (*artocarpus incisa*), since its fruits would add a great deal to the supply of foodstuffs for the people of the State.

The prices at which lands are sold vary greatly, ranging from 75 to 100 pesos per hectare. It is customary among the landowners to lease out their lands for a definite length of time.

The Mexican Federation has no lands in this State it could dispose of, unless careful demarcation

were carried on which might show some surplus lands of small area.

DISTRITO FEDERAL (FEDERAL DISTRICT)

Crops.—Although the Federal District, in view of its small size cannot be called a purely agricultural district, its lands produce very good crops, the most extensive of which is that of alfalfa but at the same time the growing of corn, wheat and other cereals is not neglected. The soil of the Federal District is extremely fertile, and has the advantage of abundant rain as well as irrigation facilities from the numerous spring-waters. The articles planted here are: corn, which produces a mean annual crop of 30,000 tons; beans, 700 tons; wheat, 7,000 tons; chile, 1,600 tons; barley, 5,000 tons; celery, 150 tons; beets, 240 tons; “haba” (the large edible bean from the *vicia faba*), 500 tons; lettuce, 1,800 tons; cabbage, 1,400 tons; carrots, 350 tons; tomatoes (the green kind), 3,000 tons; turnips, 1,200 tons; tomatoes (the red kind), 1,600 tons; garlic, 130 tons; calabash, 2,000 tons, and other varieties of plants, especially of the vegetable class.

One of the most abundant products of the Federal District and of which it consumes also large quantities supplied by the other States, is the “pulque,” *i. e.*, the fermented juice of the maguey plant, the annual output of which is calculated to be more than 100,000 tons.

The foregoing data clearly show that there is a much higher demand for all of these articles in the Federal District, wherein lies the City of Mexico, than is supplied by local production, consequently it has to import very considerable quantities of all

of them from the other States of the Republic and even from foreign countries.

Horticulture and Orchards.—A variety of fruits is produced in the orchards of the towns of San Angel, Tlalpam, Mixcoac, Coyoacan, Xochimilco; the average yearly crops can be figured as follows: pears, 300 tons; "tejocote" (a fruit resembling a sloe), 230 tons; figs, 80 tons; peaches, 40 tons, and other fruits in smaller quantities. In this regard the Federal District is also dependent upon other sections of the country, as Cuernavaca, Queretaro, etc.

Transportation.—The principal means of transportation for the moving of its agricultural products in the Federal District are the electric trains, which connect the City of Mexico with most of the towns of the District; the products from Xochimilco, Ixtacalapa, Ixtacalco, Santa Anita, Nativitas, Tulyehualco come by the Canal Nacional (National Canal) in enormous canoes, called "tragineras." Some points of the Federal District are served by the railroad lines which run towards Cuernavaca, Tlanepantla and the north of Guadalupe Hidalgo; all these places furnish foodstuffs to the Federal District.

Lands.—Although it might be supposed that, in view of the population of the Federal District, the people would devote themselves to the intensive exploitation of the land, as is generally the case in the neighborhood of large cities, there are large areas of untilled land in the District, where every inch should be cultivated, since the soil is very fertile, the rains are regular and abundant, and where, if necessary, it would be easy to establish irrigation works by means of chain wells or norias which

supply water abundantly and never need to be deeper than four meters. Excellent fruit crops could be obtained from large tracts of land in several sections of the District which at present remain unexploited. Exactly the same applies to the growing of vegetables; there is enough free land that can be devoted to this lucrative industry, as, for instance the land gained from draining of the Texcoco lake, located along the road from Mexico City to Xochimilco on both sides. Furthermore, there are lands that are not utilized at present in the southern region of the District, in Tlalpam as well as in Xochimilco and Milpa Alta, where only those lands are cultivated which offer more facilities and the best chances of success for the farmer.

The owners of land in the neighborhood of the metropolis are trying to lay out their properties for building purposes; such land is offered at different prices per square meter. Ranches are sold only in exceptional cases at prices varying according to their proximity to the city, the means of communication available and the fertility of the soil. The Federal Government has no national lands in this District.

DURANGO

Crops.—The crops to which the farmers of this State give preference are: cotton and grape-vine in the Laguna section; corn, sugar-cane, watermelon, melon and fruit in the upper section of the Nazas river; corn (especially the non-irrigated species); beans, wheat, chile, in the rest of the State. The annual crops are estimated at: 22,000 tons of cotton; 130,000 tons of corn, 10,000 tons of haricot beans, 1,500 tons of peanuts, 5,000 tons of sugar-

cane, 400 tons of sweet potatoes, 12,000 tons of wheat, 13,000 tons of chile, 300 tons of onions, 600 tons of potatoes, 160 tons of squashes, 240 tons of watermelon, 80 tons of tobacco and 780 tons of "panocha" (crude form of sugar).

On an average, about two thousand tons of cotton probably remain in the State to supply the requirements of the local factories, and the remainder is sent out to the manufacturing centers of the country, as Puebla, Tlaxcala, Veracruz, and the Federal District; the corn and haricot beans are mostly consumed in the State, the balance being sent to Torreon, Monterrey and Sombrerete; the remaining products are partly consumed in the region, and the rest shipped to other markets of the Republic. Grapes are partly shipped out of the Republic.

If irrigation works were constructed, the cultivation of wheat and other cereals could be engaged in on a larger scale, especially the growing of chickpeas or garavance, which at present yields only about 50 tons. The most suitable lands for the growing of wheat are the plains of Cuencame and San Juan de Guadalupe, and the banks of the rivers Tunal, Palomas, Suchil, Poanas, the Nazas and its tributaries. Henequen, or sisal, can be acclimatized in the eastern and northeastern sections. The "guayule" (*parthenium argentatum*), a rubber-producing shrub, ought to be especially cultivated and gathered in such a manner as not to exterminate the plant, as is now likely to happen, owing to the practice of pulling it out by the roots which contain a larger quantity of rubber than the rest of the plant. The "higuerilla" plant (*ricinus communis*) might be cultivated to advantage, as a splendid non-freez-

able oil is obtained from same, which makes it very valuable to aviators.

Transportation.—The products of the State are distributed by means of various railway lines, a few highroads and bridle paths, of which we will speak in the chapter on Roads.

Horticulture and Orchards.—Fruit trees yield good results, and, if cultivated with greater care and according to more scientific methods, would give better crops and well repay the labor expended. Grapes are grown in the region of Ciudad Lerdo and in the Bolson section, especially in the Perimetro Lavin, and are exported in cases from one to five kilograms in weight, or used for the manufacture of wines which are exported. The annual crop is estimated at about 235 tons; oranges yield 1,600 tons and are chiefly sent away; quinces amount to 300 tons; they are consumed at home and also are exported in jelly form in little boxes; guavas yield 120 tons; the chabacano (a kind of apricot) yields 150 tons; peaches, 600 tons; figs, 300 tons; the peron (a variety of apple), 200 tons; the pear, 110 tons; the mango, 800 tons; bananas, 320 tons. Some of this fruit is consumed in the State, but the larger part is shipped, the principal market being Torreon and Mazatlan.

Horticulture is very little developed in the State, but it could be increased in the same manner as the fruit-growing industry, and could count upon the markets of Zacatecas which are located upon the railroad to Canitas.

Lands.—There are enormous tracts of land containing vegetable detritus (humus) which are still uncultivated. The reason for this is the heavy cost of irrigation works necessary to make them cultiv-

able; once this problem is solved there will be an opportunity to employ five times the number of men at present engaged in agricultural pursuits. The following public utility works are contemplated for the above purpose: a dam on the river Nazas, in the Fernandez Canyon, to the west of Ciudad Lerdo, which requires an expenditure of \$25,000,000 (pesos), in which sum is included the indemnification which will have to be paid to the owners of country and town estates located within the projected basin of the waters; the canalization of the rivers Conchos y Florido, using the river beds of the "Fierro" and "Los Indios" streams, as far as Cevallos, where the reservoir will be located and of which the cost is estimated at six million pesos; the dam on the Tunal river, at the point known as "El Durazno," with a cost of \$1,300,000 (pesos), which will irrigate no less than thirteen thousand hectares; the dam in the Michilia section, on the Parra river, at a cost of \$1,500,000 (pesos); the dams on the La Boquilla, Atotonilco, La Canoa streams, in Cuencame, at a cost of about one-quarter of a million pesos each. These dams would make a very large area of uncultivated lands productive.

Although in the Laguna section, few farm lots are rented or farmed out on the share system, the land generally is cultivated by the owner himself, the cost amounting to about \$25,000 (pesos) per lot, including all the work of sowing the seed or planting, of cleaning, carting off the dirt and cobbing.

The farmers of this section of the country employ modern farm implements for their work and treat their land in a scientific manner, for which purpose they employ specialized farm engineers.

Nearly all of them grow their crops on their own account, financed by the banks. They sell land at various prices, lots of one hundred hectares in the cotton belt reaching a value of as much as \$100,000 (pesos). Landowners in the interior of the State usually plant the crops which do not require irrigation on a share basis, while those which do require irrigation (corn and wheat), they cultivate themselves. When the land is farmed on the share system, the owners supply the laborers with the yoke of oxen, the farm implements, the land, the seed of corn, beans, and other crops as outfit, for which they recoup themselves at the time of the division of the yield. Up to the present the irrigation crops have been small, due to the lack of proper arrangements for the reservation of the water, which is usually allowed to run to waste, without any attempt being made to utilize it. The land for other crops than cotton is worth from 30 to 50 pesos (15-25 dollars) per hectare of cultivated land.

There are scarcely any Government lands left, except in the mountainous section known as Sierra de Michis, Pueblo Nuevo, San Dimas and Tamaquila, lands which the Government has sold for less than ten pesos the hectare.

GUANAJUATO

Crops.—This State is the second to the State of Jalisco in the matter of producing agricultural commodities. It yields yearly 360,000 tons of corn, 26,000 tons of haricot beans (*phaseolus vulgaris*), 5,000 tons of sweet potatoes, 4,200 tons of peanuts, 16,500 tons of barley, 12,000 tons of sugar-cane, 8,700 tons of chickpeas, 2,300 tons of raw sugar,

1,400 tons of potatoes, 5,300 tons of pulque (a beverage taken from the agave), 100,000 tons of wheat, 230 tons of tobacco, 800 tons of garlic, 100 tons of artichokes (*cynara scolymus*), 900 tons of cabbage, 1,000 tons of red tomatoes, 1,400 tons of lettuce (*lactuca sativa*), 800 tons of cucumbers, 90 tons of radishes (*raphanus sativus*), 300 tons of green tomatoes, 230 tons of purslane (*jussiaea repens*), 300 tons of carrots, and some other articles.

Besides the quantities mentioned the State can produce a great deal more if proper attention is given to a number of plants, as, for instance, the different species of chile (pepper) which already now give more than 5,000 tons a year; tobacco, potatoes, peanuts, sugar-cane and a few other articles. A completely new article for agriculture in the State of Guanajuato is the cotton plant, the growing of which has been tried already in several sections of the State, especially in the "hacienda de Frias," and it has been found out that this plant would yield better results in this State than in the cotton belt of the Laguna, because in the Laguna the cultivation of a lot of 100 hectares, that is the cost of sowing, cleaning and harvesting requires the expenditure of more or less than twenty-five thousand pesos every year, while in the State of Guanajuato it costs only five thousand pesos, for the reason that in this State the water supply for irrigation purposes is a great deal less expensive than in the Laguna region, and furthermore, the articles of prime necessity are sold in Guanajuato at much lower prices. The cultivation of cotton is strongly attracting the farmers in Guanajuato, and there is no doubt that within a short time there will be many cotton plantations in this State.

Another good reason for cultivating cotton in the State on a large scale is that the product will be used as raw material by the factories established in this region. Flax, which grows well in the State of Michoacan, could be cultivated in this State with absolute certainty of good results. The soil of Guanajuato offers the best conditions for the growing of the white-mulberry tree; it can be planted all over the State with the certainty of success.

Transportation.—The following roads exist for the moving of the crops to the different sections of the country: the line from Mexico to Laredo, which touches several places of the State; the road from Mexico to Acambaro; that from Mexico to Guadalajara; from Jaral del Valle to Guanajuato; from Irapuato to Gonzalez; from Acambaro to Gonzalez; from Rincon to Pozos; from Mexico to El Paso; from Penjamo to Ajuno. Although this State has many railroad lines, it needs still more, in view of its growing development. Furthermore, as it is located in the center of the Republic, it is not far away from the markets which consume its products. This circumstance adds materially to the commercial and industrial value of the State.

Horticulture and Orchards.—The fruits produced in the State of Guanajuato are generally those belonging to the temperate zone, although there are regions in the State which are very well adapted to tropical fruits. The alligator-pear, probably not as large as the one that grows in the State of Queretaro, is, nevertheless, very large and yields about 200 tons a year; the chavacano (a species of apricot) gives an annual crop of 140 tons; the "chirimoya" (ananas cherimollia), cherimoyer, 90 tons; the peach, 2,400 tons; the strawberry (frangaria

vesca), 30 tons; the pomegranate, 180 tons; the guava, 900 tons; figs, 1,200 tons; "jicama" (*dahlia coccinea*), 345 tons; limes, 2,300 tons; lemons, 75 tons; apples, 200 tons; melons, 680 tons; quinces, 350 tons; oranges, 200 tons; nuts (different kinds), 60 tons; pears, 290 tons; watermelons, 1,900 tons; "tejocote" (*crategus mexicana*) 100 tons; the "tuna," prickly pear or Indian fig or *opuntia ficus indica*); the Castilian tuna is called that way; then there is the species called "duraznillo" (*opuntia leucotricha*) and the "cardona" (*cereus pecten aboriginus*), producing 2,400 tons a year; grapes yield 80 tons and the white sapote (*casimiroa edulis*), 130 tons.

The figures given clearly indicate that the State could produce a far greater quantity of all these fruits. At present most of this fruit is taken out of the State, but a considerable part of it is, nevertheless, consumed in the State itself.

Horticulture could also be developed to a greater extent since all the vegetables as well as all the agricultural and industrial products can be easily moved to the markets of consumption.

Lands.—There are idle lands in the region of the Bajío—an extremely fertile section, that are well watered and enjoy good humidity. The manner in which the large landed properties were formed in the country in years gone by is also evidenced in this State, so that very extensive tracts of land are in the hands of a few owners. The result of this antiquated system has been that the proprietors care very little about cultivating the largest possible areas of land, but exploit only such portions of it as their means, money as well as laborers, permit. In most cases herds of cattle live on the pasture which

naturally grows on the land. The State of Guanajuato, with a system of small farms, would undoubtedly yield far better results than those which are obtained at present. In the sections known as Bajio, Valle de Santiago, Penjamo, Yuriria, San Miguel de Allende, in fact all over the State there are idle lands alongside the cultivated areas, that are just as good as the latter.

The landowners are, as a rule, opposed to selling portions of their land, except when forced by circumstances. A hectare of land is estimated to be worth from 60 to 100 pesos (30-50 dollars).

The method of land cultivation is one which has become habitual through constant repetition during centuries: wheat planted by the owners of the land themselves for their own benefit, the laborers being paid by the day; corn, fruits and vegetables are also grown by the landlords, when the planting is done on irrigated land. Plantations which are subject to the vagaries of rain or sunshine, are carried out on the 50-50 plan between the farm hands and the owner of the land; in this case the landowners put at the disposal of the farmers not only the desired land, but also the dray animals, farm implements, the seed, and certain advances in money or in kind. In the large plantations handled by the landowners themselves, only modern implements and machinery are employed.

At present there are no national lands in the State of Guanajuato of which the Federal Government could dispose, but among the landed proprietors a tendency has become evident of late to better utilize the large areas of cultivable land, and they are open to acceptable offers for the sale of their surplus lands. Furthermore, it is possible that, as soon as

all the large properties have had their boundaries determined and adjusted to correspond to the actual holdings covered by the titles, the existence of excess or surplus lands will be revealed, in which case the distribution of these lands will be the privilege of the Federal Government.

GUERRERO

Crops.—Agriculture promises the best economic results in this State. Although existing conditions do not allow the State to undertake the exporting of any of its agricultural products, at least not on a large scale, its fertile lands even now produce large quantities of sugar-cane, cotton, sesame, coffee, sweet potatoes, beans, chile, "cascalote" (yielding tannin for the tanning industry), castor-oil seed, calabash, onions, tomatoes, etc. As to the fruits, the same thing happens here as in the State of Michoacan, in its southern section, that is, most of the fruit is lost, because there are no shipping facilities to move them to the markets.

Of sugar-cane a little over 45,000 tons is harvested, exclusive of the amount used in the manufacture of sugar, of which 3,400 tons are obtained, of "piloncillo" or "panocha" (a kind of raw or crude sugar) which yields 3,200 tons, of molasses of which 6,200 tons are produced, of rum which yields 12,600 tons. Rice yields 2,100 tons; the production of this article could be vastly increased; sesame (*sesamum indica*) yields some 35,700 tons, that is, more than is produced in any part of the Republic, in spite of the lack of the proper means of transportation. Cotton (two species: the *gossypium herbaceum* and the *eriodendron grandiflora*)

yields 5,400 tons; coffee, the planting of which was started only a few years ago, yields an average yearly crop of some 300 tons; sweet potatoes give 2,200 tons; "cascalote," which produces thirty per cent of tannin, 2,150 tons; beans, 8,900 tons; seeds of the castor-oil plant, 230 tons; calabash, *i. e.*, the Castilian calabash (*cucurbita maxima*) and the water-calabash, popularly known as "calabaza de casco," 3,400 tons; onions, 234 tons; red tomatoes, 189 tons; radishes (*raphanus sativa*), 67 tons; green tomatoes, 345 tons. The State produces also small quantities of other vegetables and cereals.

In spite of the enormous difficulties with which the State of Guerrero has to struggle in the matter of means of transportation, it is satisfied with the small profits it receives from the export of its products. It ships a considerable portion of these, especially sesame, cascalote, seeds of the castor-oil plant, sugar, molasses, raw sugar, rice, coffee, some corn, and other articles in smaller quantities, to different parts of the interior of the Republic. Some of these go also to foreign countries.

Among the new cultivations which could be introduced in the State with profit must be mentioned the cocoa-tree (*theobroma cacao*) which has already given good results in the State of Oaxaca, so near to the State of Guerrero, where the same conditions obtain for the advantageous cultivation of this plant as in the latter and Tabasco. Furthermore, the ramie, a fiber-yielding plant (*boehmeria niveatex*), could be planted in Guerrero, where it is already cultivated to some extent with the best success. The vanilla-vine would also yield good results in Guerrero, since its dense forests offer the plant the protection it needs.

Transportation.—The State of Guerrero has no rapid means to move its crops, except a section of the railroad from Mexico City to Balsas. A few ships touch also at its port of Acapulco, but by no means often enough to supply the necessary shipping facilities.

Horticulture and Orchards.—The fruits produced in this region are those that belong to the torrid zone: the alligator-pear, of which there is an average annual production of 678 tons; the annona, or custard-apple (pina—*moustera deliciosa*), which yields 980 tons; another species of annona (*chirimoya-ananas squamosa*), 345 tons; the two species of plums (*prunus domestica* and *spondias purpurea*), 480 tons; coconuts, 7,000 tons; peaches, 300 tons; “garambullo” (*cereus geometrizans*), 100 tons; guava, 600 tons; “huamuchil” (*pithecolobium dulce*), 400 tons; “jicama” (*dahlia coccinea*), 375 tons; limes, 1,000 tons; mammees (*lucuma mammosa*), 435 tons; mangos, 4,600 tons; melons, 900 tons; “nanche” (*birsonima crassifolia*), 450 tons; these latter fruits are not very agreeable to the taste to one who is not used to them, but preserved in alcohol they constitute an excellent remedy for the cure of diarrhea and similar ailments of the digestive tract. Oranges produce 3,800 tons; papaws (*carica papaya*), 400 tons; plantains (*musa paradisiaca*), 3,000 tons; watermelons, 2,300 tons; tamarinds (*tamarindus indicus*), 360 tons. The great problem that awaits solution in the State of Guerrero consists in finding a way to utilize all the fruits it produces, for enormous quantities are lost altogether; some of them are exported to the interior of the Republic and even to the United States, via the port of Acapulco, and large quantities are

consumed by animals, especially hogs, of which large numbers are raised in the State.

Lands.—The State of Guerrero possesses an enormous extent of idle lands, covered only by trees and plants which are of no use. All these lands, however, are of excellent quality and suitable for agricultural purposes. None of these lands need drainage, but rather some small leveling works, so that the streams may be made serviceable for irrigation purposes.

The price of land in this State, due to chronic difficulties in transportation, is not high, good land being quoted as low as 25 pesos (\$12.50 American money) per hectare. The owners of large tracts of land follow the system of partnership, used all over the country for the cultivation of farm land.

The State has national lands in different sections. There are reserves of some importance in La Providencia, Xolcoman, La Candelaria, Tepehualapa, which all in all aggregate about 350,000 hectares. No doubt there are other lands belonging to the State, but their extent and limits have not been well defined.

HIDALGO

Crops.—Agriculture is the principal occupation of the inhabitants of this State who cultivate rice, corn, wheat, sugar-cane, coffee, chile, haricot, beans, maguey (agave atrovirens). The coffee produced here is of the same variety as that produced in San Luis Potosi, viz.: Huasteco and caracolillo, of which the annual production is 400 tons, mostly shipped to the interior of the country. Corn produces 200,000 tons annually, more than two-thirds of this being consumed in the State. Cane yields 2,900 tons,

mostly for the local market, and very little for other towns in Mexico; barley yields 3,200 tons, partly exported; chile, 2,800 tons, less than half being shipped to Mexico City; sweet potatoes, 130 tons, for local requirements; potatoes, 150 tons; wheat, 1,500 tons, ground in mills located in the State; onions, 600 tons which are mostly sent away. We may state here that the soil of Hidalgo is suited to every kind of culture. At the present time the cultivations needing special attention are those we have enumerated, to which may be added the garavance or chickpea, beans, peas, lentils. Rice should be cultivated more extensively, also sugar-cane. The pulque maguey (*agave atrovirens*) is cultivated to a large extent and the State has some famous pulque breweries, such as those of Tepa, where the most complete experiments have been made respecting the ferments used in the manufacture of pulque, which is an intoxicating drink not well looked upon by men who wish to uplift the masses, though the latter consider it an indispensable article of food. The diastase generally used in the fermentation of pulque is that known under the scientific name of "*saccharomyces pyriformis*." Hidalgo produces 1,130,000 hectoliters of pulque a year, mostly consumed in Mexico City and the Federal District. The best pulque comes from the "haciendas" in the plains of Apam. The populace also drink "tlachique" which is the unfermented juice of the maguey, called in other parts of the country "aguamiel" or "hidromiel." The quantity of "tlachique" ordinarily consumed every year is estimated at 3,000 tons. About 1,200 tons of "aguardiente de cana" (white rum) and 1,350 tons of "panocha" (a crude form of sugar) are also obtained.

Transportation.—There are numerous routes for the transport of these products: The Mexico to Pachuca Railroad, with a number of branch lines which cover well the southern portion of the State; the railway from Tellez to Tulancingo, from Ven-toquipa to Apulco. The State has not over 300 kilometers of railway tracks.

Horticulture and Orchards.—Of fruits, the State produces annually the following average: aguacate (alligator-pear), 300 tons; peaches, 200 tons; plums, 90 tons; pomegranates (*punica granatum*), 1,200 tons; guava, 200 tons; limes, 400 tons; lemons, 1,200 tons; mangos, 130 tons; apples, 225 tons; melons, 300 tons; nuts, the product of the walnut (*juglans regia*) which gives a large nut, and the “*carya oliviformis*,” which produces a smaller nut, considerable quantities; pineapples, 2,000 tons; bananas, 2,800 tons; watermelons, 200 tons; tamarinds, 100 tons; white sapotas, 200 tons. Nearly all these fruits go partly to markets outside of the State of Hidalgo, though their value in money is small. The returns, however, could be increased owing to the proximity of good and sure markets and the facility with which products can be sent to the United States. Horticulture, at present very little engaged in, can also be developed, as Hidalgo has numerous rivers, an excellent climate, fertile lands and the facilities to reach a market for all its products.

Lands.—There are, as all over the country, large areas of uncultivated land which are rich in vegetable matter and are located right next to land at present farmed. The owners of the latter, although realizing that they could benefit by renting out the lands to small farmers, prefer to allow these lands to

remain idle. Land is sold at prices which vary from fifty to seventy pesos the hectare. Lands which are not irrigated, are given to workers on the same terms as in the rest of the country, that is to say, on "half shares," the owner supplying the oxen and farm implements, the seed, general outfit, etc., the cost of which is returned to him at the end of the harvest season.

The revision of the boundaries of property has not yet been made in this State, but it is certain that the Federal Government has a large aggregate of land which it could sell or lease.

JALISCO

Crops.—Agriculture constitutes the real wealth of the State of Jalisco. It is a great producer of cereals and justly called the granary of the country. The farmers engage here chiefly in the raising of corn, beans, chickpeas, potatoes, rice, sugar-cane, and other articles. The production of corn in this State is the largest obtained anywhere in Mexico and is never less than 500,000 tons a year. Different species of corn are raised here and they all grow splendidly; a variety of corn called "cuarenteno," that is, the non-irrigated corn (*zea mays precox*), the "palomero" or "maiz pipitillo" (*zea mays minima*), the rainy season corn (*zea mays autumnna seminibus albi*), the "pinto," red corn (*zea mays rubra*), the irrigated corn (*zea mays turgida*). The beans, that is, the haricot beans which together with the corn constitute the principal food of the Mexicans in general, produce 24,500 tons; the chickpea, which is as nourishing as the beans, grows very well in the State and is a favorite crop with the

farmers, yielding about 25,000 tons; rice, intensively cultivated on the shores of the Chapala lake gives 1,300 tons; this figure certainly could and should be raised; the peanut produces 5,000 tons. The people have already started to extract a splendid oil from this product; "chile" gives 4,300 tons, *i. e.*, all the different varieties of this plant combined; sugar-cane produces 56,480 tons; of which 5,000 tons are converted into sugar, 9,800 tons into rum, 6,000 tons into crude sugar, and 500 tons into molasses; tobacco produces about 2,000 tons; sweet potatoes, 6,600 tons; wheat, from which very good flour is prepared, 18,500 tons; potatoes, 1,400 tons; onions, 3,000 tons; lettuce, 400 tons; red tomatoes, 5,000 tons; green tomatoes, 2,400 tons; purslane (*jussiaea repens*), 560 tons; "tlachique," 5,000 tons; artichokes, 200 tons; sesame, 700 tons; garlic, 600 tons; beets, 1200 tons.

This output represents, of course, a great deal more than the State can consume, in spite of the fact that it is one of the most populated States in the Mexican Federation, having more than one million people; consequently there is a great surplus of products which is exported to other States of the Union.

Especially large quantities of corn are sent to diverse markets of the Republic, in fact not less than 340,000 tons every year; also 10,000 tons of beans; 14,000 tons of chickpeas and very considerable quantities of the other products.

A good many articles, besides those mentioned and which belong to the temperate zone, can be produced in this State, including such as belong to the torrid zone, since some sections of the State, bordering with the States of Colima and Michoacan

and the coast are in the latter zone. Among these products we have the "ramie" (*boehmeria nivea*-*tex*), already produced, but not properly exploited in the State; cotton in the southern part; henequen (*agave rigida*) and "zapupe" (another fiber-producing plant) in the zone watered by the Huejuquilla and Bolanos rivers; barley and flax, lentils, etc.

Transportation.—The State has comparatively few railroad lines, considering the large crops it has to move; the lines serving it are as follows: the railroad from Mexico to Guadalajara; that from the latter point to Manzanillo, another from Guadalajara to Ameca; from Mexico to El Paso, from La Barca to Atotonilco, etc. This net of railways is not sufficient, and the agricultural industry suffers a great deal from this deficiency. True, there are a good many cartroads, but they are not only in bad repair, but to haul goods over them is most of the time a very slow process, too expensive in the end.

Horticulture and Orchards.—Jalisco produces considerable quantities of fruits: of aguacate (alligator-pears), 16,000 tons; "bonete" (*pileus hep-**taphillus*), 100 tons; "capulin" (*prunus capuli*), 70,000 tons; plums, 1,400 tons; coconuts, 100 tons; "chirimoya," 100 tons; peaches, 14,600 tons; pomegranates, 300 tons; guavas, 3,000 tons; "huamuchil," 1,400 tons; "jicama," 4,200 tons; "chavacano," 2,000 tons; limes, 1,900 tons; mammees, 5,000 tons; mangos, 4,600 tons; apples, 50,000 tons; quinces, 1,700 tons; "nanche," 300 tons; oranges, 11,000 tons; nuts (two species), 400 tons; pineapples, 1,200 tons; papaws, 360 tons; "pitahaya" (*cereus tricostratus*), 4,000 tons; plantains, 4,500 tons; tamarinds, 125 tons; "tejocote," 14,600

tons; watermelons, 6,000 tons; melons, 3,200 tons; pears, 4,700 tons; "tuna duraznilla," 2,000 tons; white sapotas, 700 tons; yellow sapotas (*lucuma salicifolia*), 1,000 tons; black sapotas (*diospyros ebenaster*), 600 tons.

More than two-thirds of this fruit crop is exported, either to different parts of Mexico, or to the United States. The former receive the major part of the export.

Jalisco enlarges its orchards almost daily, and turns its products to better advantage. There are already several factories that make sweetmeats and fruit preserves, while some of the fruits are not exported in any other but jelly form, as the "bonete" (*pilleus heptaphyllus*) and the "tejocote" (*crataegus mexicana*), which in the preserved state are most excellent. Even the peach, the "peron," and the apple are also partly exported in this form.

Nevertheless, Jalisco can increase its production of fruits and vegetables to a considerable extent, as soon as new railways in the northern and western sections of the State permit the easy export of the products.

Nearly all the States of the Mexican Republic are awakening to the necessity of better utilizing their lands; therefore in recent years there has been noticeable a general tendency towards better distribution of the cultivable lands, in order to attain a higher level of prosperity and to get better returns from agricultural pursuits. It has become manifest to all that in the past it was a great mistake to permit large holdings of land by one concern or person, since the natural consequence of it was that the major portion of this land was either kept entirely idle, or cultivated and exploited on a scale

which did by no means correspond to what the land should produce under ordinary reasonable conditions. The State of Jalisco is the leader in the movement for a proper redistribution of the uncultivated lands without injustice to anyone, as far as possible, thereby promoting the best interests to the landowners themselves.

One of the objects of the Syndicate of Proprietors is to procure the division of all large landed properties in a way most advantageous to the general interests of the Nation. There are in the State of Jalisco, as well as in all other sections of the country, idle lands, and the area of cultivable lands, at present utilized only for pasture, is ten times greater than the area of lands used for agricultural purposes. This does not include such lands as are suitable only for pasturage, as otherwise the disproportion would be even greater. The lands in the State, as a rule, are good and can be devoted to the following crops: those in the southern section to the cultivation of cotton; those near the Chapala lake, Etzatlan and other places, to rice and sugarcane; the lands of the section called the Bahio, to the cultivation of cereals, especially wheat, which up to now has been practically neglected. One of the problems that must be solved in Jalisco is that of irrigation, in order to free the farmer from anxiety in connection with the irregularity of the rainy season. There are scarcely any irrigation works in the State, though irrigation can be easily enough effected on the river Lerma, not by building dams, but by digging canals which would water such regions as have no rivers; the same thing applies to the rivers Lagos, Juchipila, Bolanos, Armeria, and others; in all these instances the water should be

brought to the proper level, in order to permit the irrigation of the land which is more or less elevated.

The owners of large estates and even those that own lands of smaller extent in this State are disposed to sell portions of their properties in excess of what they can reasonably handle. To do so all they need is to have the prospective buyers come to them directly, and, prepared to offer the necessary guarantees. Conditions vary according to the location of the land; near the railroads and where the land can be devoted to the growing of large crops, the value fluctuates between 80 and 100 pesos the hectare; while in the somewhat distant sections, which, however, offer facilities for cultivation, the price of land ranges from 50 to 70 pesos per hectare; in the remote parts of Huejuquilla, Teocaltiche, Bolanos, etc.; the land although of very good quality does not cost more than 30 to 40 pesos the hectare.

The Federal Government has no lands in this State.

MEXICO

Crops.—Agricultural products grown in this State are: Corn, beans, barley, sugar-cane, oats, wheat, pumpkin, onions, "chayote" (a vegetable), tomatoes, and various other vegetables and garden cultures.

The corn production ranks among the first in the Republic; it is estimated at 480,000 tons a year, its major portion being sent to the Federal District. Of barley 85,000 tons are harvested annually; it is chiefly used as fodder in the stables of Mexico City. Sugar-cane brings 2,500 tons, out of which some pure sugar is won, the balance giving about 600 tons of "panoche" (brown sugar, not refined). Of oats,

200 tons are harvested, mainly for exportation. Honey yields 430 tons; of which 300 tons go to the City of Mexico. Fifty thousand tons of pulque are produced, sixty per cent of which is consumed in the Federal District. "Tlachique" (unfermented pulque) yields 80,000 tons. Of wheat, 280,000 tons are produced, and exported in various forms of flour; of pumpkin, 200 tons; of chayote, 350 tons; red tomatoes, 200 tons.

A most profitable business in the southern section of the State, especially in the District of Sultepec, Temaxcaltepec, Texcoco and in others, would be the cultivation of the grape-vine.

The white-mulberry tree is likewise easily cultivated, and a well-conducted silk industry could count on sufficiently large quantities of raw material; a more intensive sesame production, as is the case in the State of Michoacan, may also be developed without difficulty; the same may be said of fig and olive orchards and of other plants, the products of which are used in the manufacture of oils and soaps. The sugar industry could be much improved, that is, a great deal more sugar-cane could be raised and utilized, because there is no reason why the State of Mexico should not accomplish as much as is being done in the States of Michoacan and Morelos, in the regions watered by the tributaries of the Balsas river.

Transportation.—As to transportation facilities for moving the crops there are various railway lines running through the State of Mexico. All north-bound trains from the City of Mexico cross the territory of this State; likewise those from Mexico City to Veracruz, Pachuca, Cuernavaca and Acambaro. Much remains to be done, however, to en-

able the State of Mexico to fully enjoy the benefits of its productiveness.

Horticulture and Orchards.—This State is one of the most prominent fruit purveyors of the City of Mexico and the Federal District. It grows annually 950 tons of alligator-pears, 1,500 tons of plums, 180 tons of peaches, 1,200 tons of guavas, 225 tons of "jicama," 1,125 tons of limes, 1,200 tons of lemons, 145 tons of mammees, 280 tons of mangos, 230 tons of apples, 125 tons of "nanches," 1,200 tons of oranges, 300 tons of walnuts, 150 tons of pears, 3,700 tons of bananas, 550 tons of "tejocote" (a kind of small apple), 450 tons of "tunas" (the fruit of a cactus bush), 160 tons of sapotas. As there is still a lack of transportation facilities, the fruit which actually grows in the State is not fully utilized, much of it being allowed to go to waste though a fair proportion of the fruit that cannot be sent to the market for one reason or another, is used as feed for hogs as well as for cattle.

Many sound commercial reasons could be advanced for a keener interest in the larger production of fruits and vegetables in this State, in view of the increasing home consumption and the vicinity of excellent markets outside of the State.

Lands.—The State of Mexico has at its disposal a large non-cultivated area. On the large plantations only those products have been cultivated which are more in demand or which promise an assured market. Adjoining these cultivated lands wide stretches of good ground can be found, well adapted to various cultivations. There is a great probability that, as soon as the municipal limits of every city and town in the State have been defined, large tracts of agricultural land will be left in the pos-

session of the Federal Government. The lands in the valley of Toluca require an extensive irrigation system, while those in the Bravo valley and others situated towards the south need irrigation to a lesser degree.

The owners of land in this State are not eager to sell their properties or portions of them, being rather inclined to rent out the uncultivated sections. But in the exceptional cases when they do sell, they ask from 50 to 60 pesos for the hectare. Orchard lands in the south of the State cost from 70 to 80 pesos the hectare.

The Federal Government holds title to about 1,142 hectares of land in the region of Jaltipa.

MICHOACAN

Crops.—Agriculture is the principal source of wealth of this State. The products which are raised on its soil are: rice, oats, sweet potatoes, sugar-cane, haricot beans, chickpeas, corn, potatoes, wheat, pumpkin, onions, "chayote" (a kind of vegetable), peas, tomatoes, lettuce, radishes, carrots, water-melon, melon, etc. In giving the quantities of the crops in tons we must remark that these figures do not represent the entire output, but only that part of it which is made use of, as we cannot too often repeat that Michoacan produces a great deal more than it consumes. So that, to obtain a correct idea of the productivity of the State, one must keep in mind that the total crop gathered is much larger than what is here given, especially as regards fruits, sugar-cane, rice, "cascalote," etc.

Rice is raised on various farms of the Valle del Marques section, such as "Lombardia," "Nueva

Italia " and "Santa Casilda," and on others in the section of the Southern Plateau, and produces 15,000 tons which are mostly shipped to different parts of the country. Corn yields 365,000 tons, and is also partly exported; oats, 700 tons, almost entirely shipped away; sweet potatoes, 11,000 tons; sugar-cane, 120,000 tons, and is either used for domestic consumption or shipped in its raw form to other markets; to this must be added the cane used in the mills of the State. Sugar amounts to over 8,000 tons; panocha, *i. e.*, a crude form of sugar, 6,000 tons; molasses, 4,000 tons. This branch of agriculture is one which particularly suffers from the lack of transport facilities; the same is true of the rice. There are some plantations in this State, such as Los Laureles, Los Bances, Puruaran, Guadacareo, Coapa and others which could yield five or more times the present production. Sugar and other sugar-cane products, among which must not be forgotten "aguardiente" (rum) to the extent of 6,000 tons are shipped to other markets, true, under great difficulties, as the State of Michoacan has some very picturesque uneven country and is crossed by the famous "Volcanic Axis" (Eje Volcanico) of Mexico which gives rise to the central and southern table-lands, parts of which make up the terrain of Michoacan. The corn-growing plantations, such as Villachato, Cantabria, Anganguero, Querendaro, Santa Ana, Coapa, Guaracha, Zapote, Atapaneo, Rincon, are equally affected by this lack of means of communication, because under better conditions they could easily multiply their production five-fold.

Coffee, which is principally produced in Uruapan and is one of the most famous products, gives about 400 tons.

Wheat is one of the products which could yield immense returns. Present crops are estimated at 130,000 tons, as a yearly average, which are sent out of the State in the form of flour, to various parts of the country, especially to the Capital of the Republic. The principal wheat-growing plantations are: Villachuato, Guaracha, Cantabria, Rincon, Anganguero and many others. Haricot beans yield 18,000 tons; "cascalote," 1,880 tons; chickpeas, 13,000 tons; potatoes, 200 tons; pumpkins, 3,500 tons; onions, 1,300 tons; "chayote," 500 tons; peas, 540 tons; tomatoes, 850 tons; radishes, 120 tons; carrots, 300 tons; watermelons, 4,000 tons, almost all for domestic consumption; beetroot, 130 tons; turnips, 240 tons; melons, 1,600 tons.

A part of these products is consumed within the State, but, although the latter is one of the most populous, it cannot consume the entire production, so that at least half of this, and in some cases almost all, is shipped to other towns throughout the country.

Cotton cultivation is one of the industries which could be introduced in the State with great advantage, as soon as there were railroad lines which would render profitable the raising of a product growing perfectly well in those regions. Tobacco also grows well in the State; so does the white-mulberry tree, and others would become valuable if transport facilities were available. As far as cotton is concerned, the best section for its cultivation is that part of the southern table-land which lies within Michoacan, while the middle section, as for example the valley of Morelia, is best suited for tobacco and mulberry cultivation.

Transportation.—The following are the means

of communication adapted for moving these crops. The products from the southern table-land are carried on mule-back, by long and wearisome stages over rough and tortuous country, in the insupportable heat and amid swarms of mosquitoes and other pests. In order to carry the crops raised in the section of the Central Plateau, one has to use carts drawn by animals, by means of which the products are taken with difficulty and at great expense to the railway depots of Uruapan, Ajuno, Morelia, Acambaro, Tlalpujahua, Tacambaro. There is the railway line of Guadalajara, which serves a portion of the northern part, and also of Acambaro and Tacambaro, but which are totally insufficient for the tremendous needs of the State.

Horticulture and Orchards.—Fruit, more than anything else, needs rapid means of transportation. The torrid section of the State produces immense quantities of fruit, of which not even one hundredth part is turned to account. The same is true of the mango, of which only 1,700 tons out of an enormous production is made use of; of alligator-pears only 2,000 tons are saved; “capulin,” a kind of cherry, which is the “*prunus capuli*” and is not the same “capulin” used for timber, *i. e.*, the “*rhus virens*,” yields 8,000 tons; cherry (*prunus cerasus*), 120 tons; plums (*prunus domestica*), the foreign kind, and “*spondias purpurea*,” the indigenous variety, 180 tons; coconut, 1,300 tons; “chirimoya,” 220 tons; peaches, 8,400 tons; guavas, 3,400 tons; figs, 200 tons; “huamuchil” (*pithecolobium dulce*), 800 tons; “jicama,” 850 tons; limes, 2,300 tons; lemons, 460 tons; “royal” lemons, 320 tons; quinces, 1,300 tons; oranges, 2,200 tons; pears, 1,900 tons; tree-cactus (*cereus tricostatus*), 400 tons; bananas,

4,300 tons; tamarinds, 140 tons; "tejocote," 840 tons; prickly pears, 800 tons; sapotas, 435 tons, and a large number of other delicious fruits which grow in profusion and of which small quantities are used. This abundance of fruit is at the same time a drawback to the inhabitants of these tropical regions, who for this reason are lazy and indolent, knowing that even without work they can always have the means of subsistence.

The fruit of Michoacan goes to various markets in the country and also abroad, via the north. There is no need to further develop either this source of wealth or horticulture; the only problem is to utilize what it produces.

Lands.—There are still enormous tracts of uncultivated land in those estates which are most noted for their cultivation methods, so that there is an attractive field for farmers who are prepared to stand the hardships of the climate, which will be felt rather severely at the outset perhaps, but will be amply compensated for. The State owns lands of this nature, which are awaiting cultivation as soon as the problem of the effective utilization of the products has been solved.

Owners of land in this State sell lots at various prices, but, in the sections where there are means of communication, they do so only in exceptional cases. On the Southern Plateau arable land with fruit trees is worth from fifty to eighty pesos the hectare.

It is probable that in Michoacan there are some surplus tracts of land which already belong or will be found to belong to the State Government, owing to errors in measurement; there are also certain areas of land which are at the disposal of the Fed-

eral Government: in Santa Catarina, there are more than 14,000 hectares of such land; in the Los Bancos section about 31,000 hectares; in San Andres, 3,263 hectares; in Janindipo, 5,422; and in Buenavista, 5,424 hectares; all of them splendidly suited for farming.

MORELOS

Crops.—The soil of this Federal State is extremely fertile, since its lands contain a very large percentage of humus or vegetable matter, and for this very reason are suitable for all kinds of cultivation. All such plants, of course, as belong to the torrid zone, within which the entire State lies, are particularly productive, hence sugar-cane, coffee, cocoa, rice, yucca and other tropical plants are those that are cultivated mostly.

Rice produces somewhat over 9,000 tons, which leave Morelos to be consumed in other parts of the country; cane-sugar yields somewhat more than 50,000 tons, that is, more than the quantities produced in the States of Veracruz, Oaxaca or Michoacan, and this means a great deal when we consider the extent of these different States; this product is also sent out of the State, mostly to other sections of the Republic. Sugar-cane is utilized to the extent of 523,500 tons, mostly sent out of the State which needs only a relatively small portion of this huge quantity. Panocha, a kind of crude or rough sugar, very popular in other States is in small demand in Morelos; 4,500 tons are prepared of this product, partly consumed by the lower class of people in the State, and partly sent to other markets. More attention is paid to the refining of molasses, reaching some 38,000 tons every year, which are exported

to different markets. To the total of sugar-cane one must add the quantity used in the manufacture of rum, namely 23,000 tons a year, nearly all of which is sent to the various markets of the country.

Coffee is a plant which may be considered as having been but recently added to the productions of the State, yet is grown already in large quantities and of excellent quality, and has therefore found profitable markets. Its production, however, is not nearly so extensive as it certainly will be in the not distant future. Not so many years ago the farmers turned their attention to the growing of the cocoa-tree, the fruits of which up to now have been utilized only for the manufacture of chocolate, all other commercialization of this rich product being entirely neglected.

The other agricultural products in this State are: chile, which yields 125 tons; barley, 1,900 tons; yucca, 187 tons; corn, 54,000 tons; wheat, 235 tons; onions, 300 tons; red tomatoes, 340 tons; radishes, 136 tons; green tomatoes, 400 tons. A large part of all these products is exported, although the business cannot be called very profitable.

Of the new agricultural products which could be introduced in this State, in fact in all the States which lie all or in part within the tropical zone, and which possess good irrigation conditions with the best of prospects, we mention the "ramie" plant (*boehmeria niveatex*), which yields a splendid textile fiber, more than two meters long, and which through a process of ungumming can acquire the fineness of silk, but of far greater resistance than the strongest silk thread. Large quantities of this plant exist also in the States of Jalisco, Nayarit, and Sinaloa, and the scientific and systematic exploita-

tion of this valuable fiber would certainly constitute one of the most promising enterprises, from the industrial as well as from the commercial standpoint. The cultivation of the cocoa-tree and of the coffee-tree should be extended; the results would undoubtedly be very satisfactory. The zapupe plant which also yields a good fiber (agave derveyana), and which grows in the well-watered lands of the tropical zone, should be cultivated in this State; it offers a magnificent field for industrial enterprise.

Transportation.—To move its crops the State of Morelos makes use of the railway from Mexico to Balsas and the branch line from Puebla to Cuautla.

Horticulture and Orchards.—The soil of Morelos produces many different fruits which are supplied to the Federal District. The principal species are: alligator-pears, the mean annual production of which is 560 tons; anona or chirimolla (anona squamosa), 300 tons; plums, 345 tons; guavas, 367 tons; "jicama," 700 tons; limes, 5,000 tons; mammees, 20,000 tons; mangos, 2,300 tons; melons, 1,200 tons; oranges, 3,100 tons; plantains, 2,400 tons; watermelons, 600 tons; white sapotas, 780 tons; black sapotas (diespyros ebanaster), 450 tons; "pina-anona" (anona-pineapple), 1,900 tons; "chavacano," peaches, pears, "peron" (a kind of apple), quinces and other fruit are produced in smaller quantities. All this fruit from the State of Morelos is consumed in the interior of the Republic.

It would be an easy matter to increase the production of fruit in this State, but first of all means should be created for the proper cultivation of the products already grown, that is to say, there should be in the State enough large concerns engaged in the preserving and canning of fruit; such enterprises

would certainly do well from a purely commercial standpoint. It would be equally easy to extend and intensify horticulture, since good markets for the products are not far to seek.

Lands.—Though the State is small, it has uncultivated lands in the vicinity of the areas that are now worked, all of them of excellent quality and suitable for the same cultures which already have shown splendid results in other States, and for new ones adapted to the climatic conditions of this region. The landowners as a rule do not sell their lands. The hectare of untilled land is worth from a hundred to one hundred and fifty pesos (50–75 dollars). The partnership system in land tenure is applied only where such products as corn, beans, vegetables, etc., are grown. All other farming is done by laborers hired by the landowners themselves. Certain portions of the land can also be leased, but this system is not much in use, and the tenants can not obtain leases which extend over any length of time.

NAYARIT

Crops.—Without any great effort or expense and in some cases without doing more than gathering in the products, the people of the State of Nayarit are engaged in the cultivation of cotton, rice, sugarcane, chile, corn, potatoes, beans, etc., which are the principal items of agricultural production in the State.

The cotton, that is to say not the product ordinarily known under this name, but the tree-cotton (*eriodendron grandiflora*), known in this country and, in fact, all over Mexico and in some sections of Central America under the name of “pochote,” pro-

duces, on an average 3,000 tons every year; coffee, 540 tons; sugar-cane, 310,000 tons, exclusive of the cane that is used to manufacture 3,600 tons of sugar, 2,000 tons of panocha or crude sugar, and 2,400 tons of molasses, every year; the camote or sweet potato gives 300 tons; rice 2,300 tons; Irish potatoes, 425 tons; tobacco, 6,400 tons; the various species of corn, 49,000 tons; beans, 7,000 tons; chickpeas, 6,400 tons.

The larger part of this production is consumed in the interior of this State and another portion of it is exported to different parts, the United States being the best market. The poor transportation facilities do not prevent the people of Nayarit from getting their products (large quantities of them at least) to the interior of the Republic; the State of Durango is one of the consumers of the imports from Nayarit in spite of the fact that enormous difficulties must be overcome in transporting the goods across the "sierra" or ridge of mountains in this State and that of Huazamota in the State of Durango. Almost on the border line between these two States is the point of intersection of the sierra of Nayarit and that of Huazamota, both abounding in peaks of great altitude, scarcely distinguishable from one another in a place called "port of the First Wars" (puerto de Primeras Guerras). This gives one an idea of the strenuous efforts and sacrifices the farmers must make in order to dispose of a portion of their products which they cart over roads that require more than twelve days of travel across the high tables of the mountain ridges which terminate in the last counterforts of the Sierra Madre in the State of Durango. Notwithstanding this Durango is one of the best markets for the

agricultural products as well as for the cattle from the State of Nayarit. Also a large proportion of the hats that are manufactured in Nayarit are shipped over the same road; in fact, there is a regular commercial traffic, necessarily slow, between these two entities of the Mexican Federation.

As to new plants, the cultivation of the "ramie" fiber should be extended in this section of the country; there is already quite a number of these plants in the State, though they are not given the proper care due to the fact that the people do not sufficiently know and understand the high value of the fiber produced by this plant (*boehmeria nivea*). The vanilla-vine should also be introduced, for humidity, soil, shade and all the other conditions this very valuable product requires, are found in Nayarit; the same applies to the cocoa-tree. Then there is the "zapupe" (*agave derveyana*) which up to now has been exclusively grown in the State of Tamaulipas, and which in Nayarit would find the right climate and soil for its splendid development. Up to now, the States of Veracruz, Tabasco, and some of the States situated within the torrid zone have tried to acclimatize the jute fiber (*corchorus* sp.), a textile plant the fiber of which is largely used by different factories in the Republic (in Veracruz and in the State of Mexico) and of which considerable quantities are imported from Calcutta. The cultivation of this plant should certainly be tried in the State of Nayarit. The cultivation of all these new plants should be started preferably in the regions along the coast, such as Compostela, Acaponeta, San Blas and in the deep passes near the coast which are well watered and protected.

Transportation.—The roads of which the State

of Nayarit disposes for the shipping of its products are: The Mexican Southern Pacific Railroad which connects it with the States of Sinaloa, Sonora, and the United States; the maritime road for which it has the port of San Blas; then there is the mountain trail which we have mentioned already, leading to the States of Durango, Jalisco and Zacatecas.

Horticulture and Orchards.—In these two agricultural branches the problem for the time being consists in finding ways to fully utilize the products already available, for this is so little the case now that not even the domestic animals take advantage of the abundance of fruits and vegetable plants.

Nayarit is one of the principal fruit-growing States in the Republic; its main market is the United States. The following are the mean annual crops: alligator-pears, 1,200 tons; red plums, 400 tons; yellow plums (*spondias lutea*), 300 tons; "chicozapote" (*achras sapote*), 100 tons; "huamuchil" (*pithecolobium dulce*), 5,600 tons; mangos, 1,300 tons; oranges, 3,400 tons; limes, 2,700 tons; lemons, 200 tons; guavas, 1,700 tons; plantains, 3,500 tons; "pitahaya" (*cereus variabilis*), 300 tons; watermelons, 2,000 tons; melons, 300 tons; nuts (the various species), 100 tons; peaches, 400 tons; pears, 100 tons; apples, 80 tons; quinces, 250 tons.

Transportation difficulties particularly affect the fruit industry, as enormous quantities of the crops are lost. Traveling through the forests of Nayarit, one sees everywhere on both sides of the road large orchards or rather fruit forests, the products of which, when ripe, fall to the ground, forming thick carpets on the road, of no use to anybody, not even to the animals to any large extent, considering the hugeness of the crop. Here not only the hogs, but

also the dogs are fat and shiny, because they feed on the alligator-pears that fall from the trees.

These regions offer ample field for the establishment of large preserving and canning factories which would bring the best of financial results.

Lands.—There are in this State enormous areas of uncultivated lands which, nevertheless, are in every way suitable for extensive as well as intensive agricultural work. They are to be found in the valleys near the ocean, best suited to all tropical cultivations, while the lands on the high plateaus will produce corn, beans, etc. Common rye should also grow in Nayarit with good results.

Uncultivated land can be had in this State at prices generally ranging from \$12.50 to \$15 (American money) the hectare, with the exception of the land along the flat stretches of the sea coast, these costing more than one hundred pesos (fifty dollars) a hectare. Land tenure in this State is arranged on the basis most commonly used all over Mexico, that is the partnership basis.

The Federal Government has not as yet surveyed the lands that belong to it, but it is generally admitted that there are free Government lands in the sierras of Alica and Nayarit and also some tracts of land on the Pacific coast.

NUEVO LEON

Crops.—The farmers of this State specialize in sugar-cane, corn, wheat, sweet potatoes, peanuts, calabash, vegetables, beans, chickpeas and similar products.

Sugar-cane yields on an average 190,000 tons every year, not including the quantities that are con-

verted into sugar, *i. e.*, 400 tons, or into panocha, 18,000 tons, or molasses, 800 tons and rum, 600 tons. Panocha, or crude sugar, is manufactured in this State not so much as a substitute for refined sugar as is the case with a similar product in Mexico City which is called there "piloncillo," as for use in the preparation of sweetmeats and jellies, to which peanuts, nuts and other things are added, probably not very exquisite in taste but very much liked by the general Mexican public.

Corn, especially the early species (*zea mays precox*), in spite of the unfavorable conditions due to the lack of irrigation and timely rains, produces nearly 100,000 tons; wheat, 4,500 tons; nearly all of it is turned into flour; beans, 4,000 tons; chick-peas, 2,000 tons; peas, 100 tons; cabbage, 340 tons; calabashes (there are two species: the Castilian, *cucurbita pepo*, and the kind called in the country, "calabaza de casco," *cucurbita maxima*), 700 tons; green tomatoes, 350 tons; red tomatoes, 500 tons; onions, 580 tons; garlic, 200 tons; potatoes, 450 tons.

The local market consumes nearly all these products, with the exception of about 78,000 tons of sugar-cane, 12,000 tons of panocha, 360 tons of molasses and some of the sweet potatoes, peanuts, and vegetables which are sent to different markets of the Republic.

Other cultivations could be introduced in the State, such as rye for example which is not so exacting as wheat as far as soil is concerned; barley, which would find immediate application industrially, oats, lentils and rice in the southern section of the State.

Transportation.—For the moving of its crops

the State has the services of several railways: the railroad line from Mexico to Laredo; the line from Monterrey to Reata and Piedras Negras and Torreon; the line running to Saltillo and Torreon and the railroad line to Tampico.

Horticulture and Orchards.—The cultivation of fruits and vegetables should be increased in this State, because at present many of the products have to be brought in from other sources. The principal fruits produced in the State are the following: alligator-pears, which yield 400 tons; figs, 300 tons; melons, 700 tons; watermelons, 900 tons; oranges, 3,000 tons; peaches, 400 tons; "chavacano," 360 tons; capulin, 600 tons; limes, 100 tons; lemons, 140 tons; guavas, 80 tons; pears, 230 tons; apples, 150 tons; nuts (large species), 200 tons; nuts (small size), 60 tons; most of this fruit is consumed in the State itself.

Horticulture in particular should be given more attention, especially in those sections of the State where it is not difficult to arrange for irrigation, for good markets for the horticultural products could always be found in many places of the States of Tamaulipas, Coahuila and the United States.

Lands.—In this State, as in most of the other States in the Republic, there are large tracts of uncultivated land, due in the first place to the lack of irrigation facilities in most sections of the State, and secondly, because the land ownership here, as in the rest of the country, has been organized from early times on the principle of a maximum of land for a minimum of owners.

The lack of water is certainly a great obstacle to the development of the land in this State, particularly so because the rains are not abundant, and

therefore it often happens that the harvest fails altogether. Consequently what is needed is a proper system of irrigation, and for this purpose the necessary dams can be built in all the rivers which, in most cases, run through very narrow valleys, in which again there are some particularly narrow stretches where the damming in of the waters is really an easy and not too expensive task.

Land can be bought in this State from the owners at prices which vary from 80 to 100 pesos per hectare in the south, and from 30 to 40 pesos per hectare in the north of the State.

The Federal Government has no land in this State.

OAXACA

Crops.—The products to which the inhabitants of Oaxaca give preference are: sugar-cane grown in the valleys near the Mixteco river and others which flow into the Pacific; coffee of good quality; tobacco, corn, beans, garden stuff, fruit and vegetables.

Sugar-cane produces the enormous total of 638,000 tons which to a large extent (not less than 500,000 tons) goes out of the State, either reaching the center of the country by way of Puebla, or else going to foreign countries through the port of Salina Cruz. But although the quantity of cane is so large, sugar is scarcely manufactured at all, as the cane production just mentioned is quite out of proportion to the 4,000 tons of sugar which are produced annually. Molasses yields nearly 5,000 tons, and "panocha," or "piloncillo" (crude sugar), amounts to 6,000 tons, there being also a few hundred tons of white rum and cane-alcohol. Coffee yields an annual crop of 3,800 tons, being mostly

sent to the interior of the country, and a small quantity to foreign countries, principally to the United States. Corn produces 120,000 tons annually, which shows a lamentable neglect of this crop, since the soil of Oaxaca is especially suited for it, and several grades of corn named below give very good results. First of all, throughout the country there is the variety known locally by the name of "secano" (*zea mays precox*), giving two crops a year, the "humedo" (*zea mays turgida*), from which as many as three crops are obtained with irrigation, also what is known as "maiz pinto" (*zea mays rubra*), and the giant corn of the Tehuantepec region, with seeds clothed with a fine covering like green corn, but each seed separated from the other; this is known by the scientific name of "*zea criptosperma*." Possibly the very small production of this product is mainly due to the lack of roads along which to transport it, as it is not profitable to transport this crop on mule-back. Anyway, this is a branch of agriculture which will receive a strong impetus as soon as the State has solved the problem of rapid means of transportation. In wheat production the same sad condition prevails, only some 3,000 tons are produced. This cereal, like corn, is not exported, since the production within the State is not even sufficient to meet local needs. The quantity of tobacco grown is very small compared with what Oaxaca is capable of producing in this respect; 500 tons in a year is the insignificant output in a section with such well-known facilities for tobacco-growing. Nearly all the tobacco raised in the State is sent to the Capital of the Republic, where it is bought by the large factories established there. Of other varieties of agri-

cultural produce, such as tomatoes, which yield 280 tons, squashes, yielding 600 tons; radishes, with a production of 150 tons, nothing more than the bare quantity required for domestic consumption is grown; nothing is shipped to other towns in the Republic.

The lamentable condition of agriculture is the more remarkable when one considers the fertility of the land, its large area which is available for agriculture, its geographical location and the facilities for irrigation which, if not perfect, are at any rate sufficient to allow the utilization of immense tracts at very small cost. The agricultural problem of the State of Oaxaca is to extend present operations and to initiate the cultivation of new kinds of crops which will give the best results. One of these is the cultivation of cotton, for the supply of a large number of mills which might be established throughout the State (there is not a single one at present). Oats, rye, lentils and rice could be grown with profit; especially rice, which thrives in damp or marshy soil or that which is adapted to well-drained land. These give splendid results in the State of Michoacan, and conditions in the south of that State are not unlike those which obtain in the State of Oaxaca. The advantage of rice cultivation is that it is an article of great demand abroad, and the product of this crop could be sent to the towns of the Pacific coast and also to Europe by the Tehuantepec Railroad.

Transportation.—At present there are the following lines which, as we have already stated, are insufficient: The Oaxaca to Mexico Railway, crossing the State of Puebla; the Puebla to Ejutla Railway; the National Tehuantepec Railroad, and the

urban and agricultural lines of the City of Oaxaca. The State has a rather inadequate maritime service rendered by the Naviera del Pacifico Company, Mala del Pacifico, Naviera de los Estados de Mexico, the Kosmos line, etc., which touch at its ports of Salina Cruz and Puerto Angel, more or less regularly.

Horticulture and Orchards.—The soil of this section of the country is suitable for the growth of every class of fruit trees, but this branch of agriculture is also neglected, as may be seen from the following figures: custard apples, “anona” (not the “anona palustris” of Campeche, which produces a wood similar to cork, but the “chirimoya,” of which the botanical name is “anona chirimollia”), 230 tons; coconuts, 1,400 tons; chicozapote (achras sapote), 780 tons; peaches, 350 tons; prickly pear, 740 tons; mammees, 1,980 tons; guavas, 400 tons; mangos, 3,100 tons; melons, 340 tons; oranges, 1,300 tons; bananas, 2,200 tons; watermelons, 300 tons. Only a very small part of the fruit produced is made use of; many of the above-mentioned varieties grow wild in the forests of Oaxaca and a large quantity of them goes to waste, year after year. Of that which is gathered, the greater part is sent almost entirely to the United States.

Fruit-growing here is conducted under the disadvantages that usually result from deficient railway communication and that are met with in most of the States; further development is not needed so much as the utilization of what the soil already produces.

Lands.—Oaxaca offers excellent prospects for business enterprise, and is one of the States which has the largest extent of national lands. Although, for the present, those lands cannot be purchased by

private concerns, they can be rented on exceptionally favorable terms for any business undertaking. In the region of the Isthmus alone, Oaxaca has more than 540,000 hectares of national lands, and as soon as the revision of the country estates is carried out there will certainly be found more in other sections.

All sections of the State have large tracts of uncultivated land, which the owners will sell for from forty up to seventy pesos the hectare, and it can be obtained even for less in locations least favored with means of communication. As far as the cultivation of corn is concerned, the old Spanish system is generally followed in the case of the non-irrigated corn, viz.: that of shares, the landowner advancing everything needed for working the land, such as seed, implements, etc., and also for the support of the laborer and his family, until the time of settlement after the harvest.

PUEBLA

Crops.—This is an agricultural State, growing, in its flat sections, the various species of corn which, as a rule, are preferred in the country; it also grows beans, wheat, Irish potatoes, sweet potatoes, calabashes, "chayote," chile, radishes, red tomatoes, cabbage; in the southern section of the State, along the banks of the rivers Mixteco and Mescala, sugarcane, tobacco, rice and coffee are cultivated. Rice yields an annual average of 3,100 tons, and is sent to the different markets of the Republic, where, however, it is not liked as well as the rice from the State of Michoacan which always commands better prices. It is well to state that the cultivation of rice in this State is by no means developed to the extent it should be, in view of the natural resources of the

lands and rivers of Puebla. Sugar-cane produces about 300,000 tons, not including the cane that is turned into the various kinds of sugar, rum and alcohol. Coffee yields 1,139 tons, more than two-thirds of which goes to different regions of the Republic and some to foreign countries. Sweet potatoes yield 160 tons, all of which is consumed in the State itself; the bean crop reaches 20,000 tons; corn, 180,000 tons; the plantations near San Juan de los Llanos are famous for the production of this grain. The species of corn grown in this State are: the one which is known as "humedo," that is wet corn (*zea mays autumnna seminibus albi*) on the banks of rivers and streams and on lands exposed to inundations; then there is the corn called "temporal" or "secano" (*zea mays precox*), also called by the farmers "cuarenteno," which means "of forty days," because the farmers believe that this kind of corn requires only forty days for its complete development; in this they are mistaken, for the fact is that this corn develops within fifty days from the time it has sprouted; the farmers plant also the corn called "de riego," *i. e.*, irrigation corn (*zea mays turgida*) on lands which can be irrigated. Tobacco yields 300 tons a year, partly utilized in the factories of the State, the rest being sent to the large factories in the City of Mexico, where it is considered the equal of the tobacco grades from the States of Veracruz, Tabasco and Oaxaca. The annual potato crop yields 9,500 tons. Puebla is the State which produces probably more potatoes than any other State in the Republic; especially are the regions of Teziutlan, Esperanza and adjacent sections mostly devoted to the cultivation of that tuber, which is exported to the City of Mexico or

the port of Veracruz, whence it goes to foreign markets. Garlic yields 450 tons; onions, 800 tons; calabashes, 1,296 tons; cabbage, 200 tons; "chayote," 300 tons; radishes, 300 tons; red tomatoes, 960 tons; chile, 6,200 tons; a large proportion of these products go to the City of Mexico, another to Pachuca, a great mining center which consumes much of the agricultural products, especially vegetables from Puebla; some of these products go to Veracruz, and from there to foreign countries.

There are cultivations which the State of Puebla could extend, such as that of tobacco, coffee, potatoes, these being products which experience has already shown to give excellent financial results. The growing of cotton could also be introduced in this State which has the advantage of a number of factories already established within its borders and that use this kind of raw material. Cotton should be planted preferably in the region of Atlizco, Chiautla and Izucar. The cultivation of rice should be extended, its export being facilitated by the road of Veracruz, whence it might go to the United States. Equally good results would be obtained from the introduction of chickpeas, peas, lentils, oats, etc. Wheat, which at present produces 24,400 tons a year on the average, would yield a great deal more, if more land and energy were devoted to this grain. Most of the flour that is manufactured in the mills from the wheat of Puebla is exported to foreign countries. The great plains of San Juan de los Llanos, San Andres Chalcicomula, Cholula, Teziutlan, could be very well adapted to the increased cultivation of wheat.

Transportation.—The principal roads for the moving of the crops of the State of Puebla are: the

railway from Puebla (city of Puebla) to Chiautla; the road from Puebla to Mexico City; via San Martin Texmelucan and Texcoco; the other railway from Puebla to Oaxaca with branch lines to Esperanza and Acatlan; another road from Puebla to Jalapa and Veracruz and the line from Mexico City to Puebla which touches points of the State of Puebla. As seen the State has quite a number of railroads, but the proper development of all the sections of the State requires many other lines, leading to Zacapoaxtla, Izucar and other parts of the State which show good agricultural prospects.

Horticulture and Orchards.—The State of Puebla produces a great deal of fruit, but does not use all that is produced in its magnificent forests and orchards; from among the many different classes of fruit we mention: the alligator-pear with an annual average crop of 1,500 tons; anona, 200 tons; "capulin," 1,400 tons; plums, 190 tons; "chavacano," 340 tons; "chirimoya," 175 tons; peaches, 1,600 tons; pomegranates, 186 tons; guavas, 1,000 tons; "jicama," 900 tons; limes, 2,100 tons; mammees, 1,200 tons; apples, 2,000 tons; melons, 300 tons; oranges, 4,200 tons; nuts (the large one—juglans regia), and the small species (*carya oliviaformis*), 290 tons; white sapotas, 1,150 tons; black sapotas, 1,600 tons. About half of this fruit is for the domestic market, while the other half goes to Mexico City and the United States.

Among the products of the agricultural industry we must mention particularly the sugar obtained from cane in the southern region of the State, especially in Atlixco, and which yields a yearly average of 11,300 tons, most of which goes to Mexico City, whence a portion is exported out of the

country, especially to the United States. The number of sugar mills in the State of Puebla could be increased very considerably. The extension of sugar-cane plantations and the establishment of new sugar mills would certainly constitute one of the finest investments of foreign capital in this State. The sugar industry of the State has a great future before it, especially if new railroads are constructed that cross the sections of the State watered by the large rivers. The coffee tree, already cultivated in the tropical zone of the State, yields on an average 1,100 tons a year, and constitutes another important element in the future commercial development of the State. The coffee produced here is somewhat inferior to that obtained in the Uruapan, but it is superior to the grain produced in the Huasteca region of this State and the Huasteca of the States of San Luis Potosi and Hidalgo.

Besides the regular refined sugar the cane, as in most sections of the Republic, furnishes also a kind of crude sugar, called "panocha" in some parts of Mexico and "piloncillo" in other sections. Puebla produces about 7,000 tons of this sugar. Quite a considerable quantity of the cane produced is employed in the making of thick molasses, very much liked by the poor class of people. We must repeat that there is in the State ample opportunity for the establishment of an unlimited number of sugar-cane plantations and corresponding industries, for there is a ready market for all that can be produced. The State, which in some sections produces the "pulque-maguey plant" (*agave atrovirens*), obtains more than 75,000 tons of the beverage called "pulque," a part of which is sent to the Valley of Mexico, and the rest consumed in the State itself. The juice of

this agave plant is also turned into an unfermented beverage, known as "tlachique" or "aguamiel," of which about 14,000 tons is consumed in the State every year.

The cultivation of fruits and vegetables should receive better attention in this State, since it has not only all the facilities to reach the best markets in the Republic, such as the cities of Mexico, Pachuca and others, but also to export its products to foreign countries. The good roads that exist already and those that will be built in the near future offer sufficient guarantee for the success of the further development of the different agricultural activities.

Lands—Although land on the whole is well exploited, there are, nevertheless, large areas of uncultivated, though very fertile lands, which the farmers do not care to till, through lack of interest and energy or because of the shortage of laborers; they sell such lands at prices which range from 80 to 100 pesos (40 to 50 dollars) the hectare. The high lands in the plains of Chalchicomula, San Juan de Llanos and the plains of Apam which belong to this State need irrigation; consequently irrigation dams must be constructed in the rivers and streams, which, since most of them run through narrow valleys, offer wonderful facilities for the purpose. In fact, all over the State engineering works are necessary to divert the water from the rivers to splendid lands which, properly irrigated, will yield enormous crops.

Landowners of this State, as in other States of the Republic, enter into partnership agreements with their tenants for the cultivation of their lands.

In the State of Puebla the investigation of titles to the land actually held has not as yet taken place.

The truth is that nearly all the large estates in the Republic hold and call their own a great deal more land than they legally possess, not necessarily because the proprietors lack honesty in the matter, but simply because the boundaries have been wrongly determined from the beginning, and that means in some instances ever since the Spanish colonization period. Therefore there is every reason to believe that in this State also there exist large areas of excess or surplus lands, of which the Federal Government will be able to dispose for the best interests of the nation.

QUERETARO

Crops.—The people of the State of Queretaro devote most of their attention to agriculture, and particularly to the growing of wheat, so much so that its wheat crop is almost as large as that obtained in the largest States that grow this grain. Corn, beans, chickpeas, lentils, some sugar-cane, vegetables, a very fine and justly famed sweet potato (camote), peanuts, Irish potatoes, tobacco, chile, calabash and other products are greatly favored by the farmers of this State. The lack of irrigation works prevents agriculture from freeing itself from the inconveniences of an uncertain rainfall.

The method of planting called in the country "de secano," *i. e.*, which needs no watering, is followed, especially in the region of the "Bajio," to which the city of Queretaro itself belongs; but in the southern section of the State, particularly in San Juan del Rio and Cadereyta only such crops are possible as require irrigation.

The camote or sweet potato that is produced in

this section of the Republic enjoys a particularly high fame, and yields, on the average, not less than 1,200 tons per year; most of it is cooked in ovens and sold under the name of "tatemado"; it is offered for sale to the passengers on the trains that stop at Queretaro. In quality it cannot be compared with the famous "camote de Puebla," which is prepared in a different way and is claimed to suit the most refined taste, but nevertheless, the Quere-taro camote is well liked by all. Chile, another common product, yields 4,800 tons a year, being sold partly in the shape of "chile verde" (green chilli), partly simply dried or baked in the sun, and some of it preserved in vinegar. The various species of chile are grown, viz.: "chile bolita" (*capsicum cordiforme*), common chile (*capsicum annum*), "chile guajilla" (*capsicum longum*), and "chile piquin" (*capsicum annum cerasiforme*). The variety called "guajilla" also "tornachile" is the one that is generally preserved in vinegar. Sugar-cane yields 3,000 tons; of this plant some refined sugar and about seven hundred tons of "piloncillo" or brown sugar are manufactured. Wheat is cultivated in the Bajio region. The great plains of Quere-taro are very productive. The annual crop of wheat is calculated to be 14,000 tons, much of which goes to the flour mills of the State. The flours made from it are as good as those of the State of Michoacan, and that means that they are of the best that are milled in the country. Corn (the early species and the one called wet corn) thrives well in the large plains of Queretaro, yielding about 70,600 tons a year. Peanuts yield 300 tons; Irish potatoes, 500 tons; lentils, 100 tons; beans, 6,900 tons; chick-peas, 3,400 tons; lettuce, onions, radishes, cabbage,

beets, etc., are produced in small quantities which scarcely suffice the local demand.

Of the production we have named a large portion is disposed of in the local market, and the rest is sent to other places of the Republic. Flour, corn, beans and barley, of which the State produces about 5,000 tons annually, are practically all shipped out of the State; of the chile that is produced not less than 2,400 tons are sent away; not less than 800 tons of Irish and sweet potatoes are exported.

Many other cultivations could be introduced in Queretaro. Rye would do very well, since it is not difficult to grow and does not require much water; sorghum (*sorghum vulgare*) could be cultivated in the sections of San Juan del Rio and Cadereyta; sesame and the castor-oil plant should be tried in the State, since in all probability they would bring excellent results.

Transportation.—The productive regions of this State enjoy the advantages which make agricultural products so much more valuable, that is, rapid means of transportation. The territory of the State is crossed in the direction of its greatest dimension by the railroad lines which run from Mexico City to the border towns of Laredo and El Paso, and by the one that runs to Guadalajara, also from Mexico City. To this favorable circumstance must be added the fact that it takes only six hours by rail from Mexico City to the city of Queretaro; consequently business men have all the facilities to handle their merchandise and products without much expense.

Horticulture and Orchards.—Queretaro is also a producer of fine fruits; its alligator-pears are packed in special baskets and sold to the passengers on the trains that touch different points of the State, es-

pecially at the city of Queretaro; the crop of alligator-pears amounts to no less than 700 tons; limes, produce 600 tons; strawberries, 30 tons; guavas, 90 tons; "chirimoya," 70 tons; plantains, 150 tons; peaches, 400 tons; "chavacano," 240 tons; "capulin" (*prunus capuli*), 540 tons; pears, 200 tons; figs, 300 tons.

Much of this fruit is exported from the State to different parts of the Republic, especially to the cities and towns of the north of the country.

The growing of fruit should be extended in the State; the beautiful climate of Queretaro, the great fertility of its lands, and the facilities to move the crops are reasons which support such an assertion. The same applies to horticulture and the growing of vegetables, of which at present the farmers of Queretaro do not produce more than is needed for the local demand.

Lands—As in the rest of the country so also here we notice that large areas of cultivable land are not utilized, due, it is claimed to the scarcity of laborers and capital, and the lack of proper markets for the products. Nevertheless, a great change has taken place all over Mexico in recent years, and the people begin to awaken to the fact that the soil of the country holds great latent forces which can easily be made to contribute to the rapid economic development of the land. As a rule only such tracts of land are cultivated as offer no difficulties of any kind, while the lands that require certain preparation, irrigation or drainage, etc., are entirely neglected. Consequently there are large stretches of uncultivated land all over the State, in the section of the Bajio as well as in the south. Nearly all of this land requires irrigation, so much neglected up

to now and yet so useful for the development of agriculture. Dams could be constructed in several canyons and gorges of its mountains, in order to retain and distribute the waters from the rivers as well as from the streams formed by the very abundant precipitation during the rainy season.

As is mostly the case in Mexico, those that possess large estates, do not care to sell any of their land; nevertheless, there has been noted a change in this policy, since the landowners themselves begin to understand that the country's welfare as well as their own may be greatly increased by having the largest possible amount of the land properly exploited. Cultivable land is worth from 60 to 80 pesos (30-40 dollars) the hectare; land that has been under cultivation is a little higher in price, while the entirely unimproved land costs less.

The Federal Government has no land in this State.

QUINTANO ROO

Crops.—Tilling of the soil to any considerable extent could hardly be expected in so vast a country as this Territory with scarcely any inhabitants. There are a few coconut plantations along the coast, one having 200,000 trees, another 20,000, and still another 10,000 trees; then there are a few plantations of lesser importance. Corn, beans, sugar-cane, coffee, plantains, pumpkins and pineapples are planted, but for local consumption only, in the neighborhood of Payo Obispo, Bacalar, and partly in the section of the country forming the limits of the State of Yucatan. Pineapples are grown to a considerable extent on the island of Cozumel which geographically belongs to this Territory. The

pineapples are exported to the State of Yucatan and the coconuts to Belize, British Honduras, whence part of them are shipped to the United States. The soil of Quintana Roo is largely composed of vegetable mold or humus, with very little rock and consequently easily cultivated with modern agricultural implements. The ordinary cotton and the cotton-tree, tobacco, rubber-trees, white-mulberry trees, the castor-oil plant and the vanilla-vine could be cultivated with the very best results.

Transportation.—As we have already stated Quintana Roo is not developed in any way, so that there is not a single railroad or highway worthy of the name; but there are a few small ports, such as Bacalar and Payo Obispo, from which vessels communicate with the British Colony of Belize, the neighboring islands and the ports of the State of Yucatan.

Horticulture and Orchards.—The native people of the Territory do not engage in vegetable gardening, such as we know it in civilized regions, nor are fruit-trees cultivated, for, as in the case of general agriculture, the reduced number of Indian inhabitants do not care to plant or cultivate anything beyond their actual daily need. Of course, all the tropical fruit-trees, such as mangos, sapotas, guavas, "guayas," India plums, "guanabanoes," anonas, "nances" and others could easily be planted and certainly will be planted, with good financial results, by a new population of immigrants who will thus redeem enormous areas of splendid lands. Stretches of land appropriate for the cultivation of bananas on a large scale are found all along the coast of the Territory, with a fair possibility of being extended

towards the interior. Oranges and lemons grow wild in this country.

Quintana Roo being a Territory, not a State, the sale or lease of land depends entirely upon the Federal Government, which certainly would be glad to give outsiders all possible chances and facilities to undertake the development and exploitation of the richest soil on earth. Our opinion is that settlers, having some capital to start with and the necessary energy and perseverance, would do splendidly within a relatively short time, planting bananas, pineapples, coconut-trees and the vanilla-vine.

SAN LUIS POTOSI

Crops.—There are in this State three zones, entirely dissimilar as far as cultivation is concerned: the Huasteca region, which is very rich and in which as many as three crops a year can be obtained; here coffee, sugar-cane and tropical fruits are cultivated chiefly; the central section, with very rich lands located in great open valleys, in which are grown corn, beans, wheat, chile, camote (sweet potato), tomatoes, etc.; the Salada section, almost barren, which only produces pasture and, in a very few places, corn and other cereals.

The crops of the State are considerable and may be calculated as follows: coffee (type "caracolillo" and "Huasteco"), 2,000 tons; sugar-cane, 38,500 tons, of which a part is converted into "panocha" estimated at 9,000 tons, some sugar, and the rest sent to the market in the form of sugar-cane; watermelons, 300 tons; cantaloupes, 100 tons; corn, 200,000 tons; beans, 60,000 tons; wheat, 900 tons; chile, 600 tons; onions, 260 tons; sweet potatoes, 1,900 tons.

Of these quantities a goodly portion remains in the country; and the rest leaves the State to satisfy the needs of the port of Tampico, of Monterrey, Aguascalientes and other places. Cotton is cultivated, although not on a large scale, in the Huasteca section, the entire production being consumed in the factories of San Luis, which also import a considerable quantity from outside. The coffee production greatly exceeds the domestic requirements and, little by little, good markets are being opened up, for which reason the farmers are considering the advisability of increasing the area devoted to this crop. The installation of machinery for the treatment of sugar-cane will result in the increased cultivation of this plant and will give much better results than those obtained at present. The Huasteca district should pay much more attention to the culture of cotton. That which is produced there is of excellent quality, and the richness of the soil and the abundance of water for irrigation purposes would greatly facilitate an increased production of this plant. It would be of great advantage to cultivate the mulberry-tree for the silkworm industry, especially in the regions of Santa Maria del Rio and Rio Verde, in which places it is already grown, though not to the extent which might be desired and which the quality of the soil makes possible.

All the agricultural industries of the State can be further developed. Those of the Huasteca section can be increased by a better utilization of the present returns, so that even larger quantities than those we have mentioned, will not be wasted, but fully commercialized. Fruit is particularly wasted for want of a proper system of gathering it and the lack of rapid means of transportation. Corn, beans and

wheat could be grown on a larger scale, also other crops, such as the chickpea, which is an excellent food, the common pea, broad beans and many others, could be introduced in the central regions of the State.

Transportation.—Although the State of San Luis Potosi has two railways, it has not sufficient transport facilities to move its crops, which results, as we have stated before, in a large part of these crops being wasted. The most serviceable line for the transportation of its crops is the Aguascalientes to Tampico line; about 400 kilometers of railroad track of this line pass through the richest sections, and there is a branch line which goes to Rio Verde (starting from San Bartolo) and covers another 42 kilometers of agricultural land of the very finest grade. On the other hand the railroad which serves this territory is the most suitable for export traffic, as the latter is directed principally to Tampico.

Horticulture and Orchards.—Fruit is included among the crops of the State which enjoy a good market. In San Luis they gather about 1,200 tons of plums, 300 tons of peaches, 400 tons of guavas, 450 tons of figs, 1,500 tons of limes, 690 tons of lemons, 500 tons of mangos, 200 tons of apples, 200 tons of quinces, 4,500 tons of oranges, 150 tons of peron (a kind of apple), 4,400 tons of bananas, 9,000 tons of prickly pears, 200 tons of grapes, 280 tons of sapotas, part of this fruit being consumed in the State itself and part being sent to other markets, such as Tampico, Monterrey, Saltillo, Aguascalientes, Zacatecas and many others. Part of the fruit which reaches Tampico from San Luis Potosi is exported to the United States.

It is certain that at present the State produces

more than it can gather in, in the Huasteca region. In order to obtain better results it is necessary to have lines of railroad crossing that section in all directions. With railroads available, cultivation could be intensified. In the center of the State it will be possible to increase the amount of wheat raised, especially if the dam, which has been projected in the Colimote section, and which is one of the most important utility works in the State, is rapidly constructed. Horticulture also permits of further development, as it has a good market at Tampico and the oil-field district, which could be supplied with great facility. Fruit cultivation, before being extended, needs some means of utilizing that which is already produced, and that even now amounts to much more than can be marketed. Large fruit-canning factories could be established here with the certainty of success.

Lands.—All over the State there are large tracts of uncultivated land, because only a small part of the arable land is tilled. In fact, all the estates have uncultivated lots, as the farmers plant only parts of their rich lands. The Huasteca lands (*i. e.*, the land in the section of the State called the "Huasteca") need not only irrigation but also drainage; those situated in the center need irrigation works in particular, there being already a project approved by an Act of Congress, authorizing the construction of the Colimote dam, for which a company has already been formed with sufficient capital to carry out the plan. The whole of the State expects to be benefited by this undertaking. The farmers will then be able to double or treble their cultivations, thus giving rise to new industries and the employment of labor.

In the Huasteca section the properties are very much cut up; here, the farms, as a rule, cannot be called large estates (*latifundios*) and are in many cases jointly owned by several persons. But, even under these circumstances, the land is so rich, so abundant in its returns, that the properties could be subdivided still further, giving an excellent opportunity for enterprising men to obtain immensely rich lands. In the central part of the State there are a few properties which are extremely large, and which, according to the Agrarian Law of the State, must be reduced in area. The owners must sell the lands which they do not cultivate and which are in excess of the acreage allowed. This circumstance gives one an opportunity to acquire lands at a reasonable price, less than forty pesos the hectare of cultivable land and under ten pesos the hectare for land which is considered merely fit for pasture.

Besides being transferred by sale which is absolute and gives a good title, and is effected under the most favorable conditions, according to the grade of land purchased, the region in which it is located, its proximity to means of communication, etc., arable, fruit-growing and timber lands may be rented from the owners. Such lands so vary in quality that there are some in the Huasteca region which cost one hundred pesos a year rent and more, per hectare, while there are others which are sold outright for fifty pesos a hectare, or even less. The former practice is particularly common in the section which is considered oil-bearing, where the owners do not wish to sell, or do so at fabulous prices. In the center of the State much easier terms can be obtained; here the owners are willing to rent the lands, or contract for the farming of same on a half-share

basis. In the latter case the owner provides the land, the yoke of oxen, the seed, the farm implements, etc., and the value of his investment is deducted at the time of dividing the proceeds of the crops.

In almost every part of the State there are Government lands, although in no case of very large extent. At the present time the Federal Government is not disposing of its land by sale, but is renting it on very easy terms. Such terms are at times varied by the Government to suit some special case.

SINALOA

Crops.—The lands of the State of Sinaloa are very rich and capable of producing anything. The climate is tropical along the coast which is high and well defined. The products of this section of the Mexican Union are many, but those preferred by the farmers are the following: sugar-cane, cotton, peanuts, sweet potatoes, chile, beans, chickpeas, corn, Irish potatoes, wheat, tobacco, vegetables, etc.

The cultivation of sugar-cane increases every day, and there are already several mills which manufacture sugar, molasses and "piloncillo," or brown sugar. The average yearly crop of cane is 72,000 tons, exclusive of the cane that is turned into sugar (18,500 tons), piloncillo (4,600 tons) and molasses (2,000 tons). The cotton that is planted yields 600 tons; this quantity will be greatly augmented, as soon as the farmers devote themselves more to the cultivation of this plant. There is, true enough, the difficulty of shipping the product to the markets of the Republic at reasonably low prices. Good crops are obtained from the peanut, which the people begin to utilize, by turning it into edible oil;

it yields somewhat more than 900 tons. Sweet potatoes yield 500 tons; "cascalote" (a tanning product), 2,300 tons; chile (preferably the "capsicum annum" species), 2,000 tons; beans, 11,000 tons; chickpeas in the cultivation of which the people here follow the methods in use in the State of Sonora, 5,000 tons; corn (preferably the species "zea mays turgida" and "zea mays precox"), 56,300 tons; Irish potatoes, 300 tons; "tomatillo" or small tomatoes, the botanic name of which is "physalis angulata," 120 tons; calabashes, 10,000 tons; Castilian calabashes, 2,300 tons; onions, 400 tons; lettuce, 230 tons; cabbage (*brassica oleracea*), 160 tons; beets (*beta vulgaris*), 60 tons; carrots, 80 tons.

At least one-third of this crop is taken to different places in the Republic and to foreign countries; its principal consumers are the people of the State of Durango, chiefly those who live in the mountains of the Sierra Madre, that is in San Dimas, Tamazula, Pueblo Nuevo and in the settlements belonging to the districts of these towns; and those in the several towns in the southeastern section of the State of Chihuahua and the south of the State of Sonora. The State of Nayarit and the Territory of Baja California are also good markets for the products of Sinaloa.

A small part of the cotton is utilized in the spinning mills and weaving factories of the State which are not of much importance, more than three-quarters of the production being exported to foreign countries.

As to the products obtained in the State of Sinaloa we must make special mention of "mezcal," a beverage prepared from the maguey plant (*agave asperuna*), of which 3,500 tons are turned out; then

of the "ixtle" plant (*agave falcata* or "guapilla"), which yields a valuable fiber, from which a number of different articles, such as cords, etc., are manufactured.

The following cultivations could be undertaken with absolute success in the State of Sinaloa: the "zapupe," along the rivers Sinaloa, Fuerte, Humaya, Tamazula, Piaxtla, Elota, Baluarte, especially in its course near Durango, due to the circumstance that they run through protected and warm valleys. The "henequen" (another fiber-yielding plant which constitutes the wealth of the State of Yucatan) would grow in the high sierras, especially in the table-land of Las Hormigas; the Japanese cane (*tripsacum latifolium*), which has already been introduced in the State of Tabasco and which in this State could be cultivated in the section watered by the lower course of the rivers Baluarte, Las Canas, Sacramento and others; ginger (*zingiber officinale*) which can be acclimatized in the vicinity of Mazatlan; the "ixpengua" (*dioscorea convolvulacea*), which grows in the State of Chiapas, where it is also called "mother-corn" (*madre del maiz*), the tuberous root of which is used by the natives to make different foods; this plant would do well on the borders of the State of Nayarit, on the low and swampy lands near the Las Canas river. Ginger would undoubtedly give good results in those lands where rosemary (*rosmarnius officinalis*) and sweet basil (*ocymum basilicum*) grow; both of these plants grow well in Sinaloa. The yucca-plant (*manihot palmata aipi*) should also be planted in this State which has good soil, a hot climate along the coasts and splendid irrigation facilities; furthermore the jute (*corchorus* sp.), and the vanilla-vine, in the

hotter sections to the south of Rosario and San Ignacio, but on the last declension of the Sierra Madre; the "jojoba" (*simmondsia californiana*) and so many useful plants that grow in the torrid zone.

Transportation.—For the moving of its crops the State of Sinaloa depends on the Mexican Southern Pacific Railroad, which, starting from Nogales, Sonora, on the border line with the United States, goes to Tepic, State of Nayarit; also on the ships that visit its ports and on its pack-animals, such as mules and donkeys that carry the products over the Sierra Madre mountain chains. There is, therefore, a great need of more and better means of transportation.

Horticulture and Orchards.—This State is one of those that is capable of producing the largest fruit crops. At present a considerable proportion of the fruit is lost in the forests, chiefly due to the shortage of labor, the lack of roads and of some method of preserving such fruit as cannot be consumed in the State or exported in time.

The following quantities of fruit are produced: plums, 600 tons; guavas, 730 tons; peaches, 360 tons; dates, 240 tons; "datil cimarron" (*agave* sp.), 100 tons; oranges, 2,300 tons; alligator-pears, 1,200 tons; "aguamas" (*bromelia pinguin*), 120 tons; lemons, 230 tons; mangos, 1,800 tons; papaw, 250 tons; mammees, 100 tons; "pitahaya" (*cereus variabilis*), 300 tons; plantains, 4,000 tons; melons, 2,000 tons; watermelons, 6,000 tons; "huamuchil" (*pithecolobium dulce*), 135 tons; quinces, 140 tons.

The State does a considerable export trade in fruits; at least three-quarters of the above quantities are taken to different markets, especially to the

State of Durango, and quite a substantial part to the United States.

The cultivation of vegetables is carried on under the same difficulties which hinder the proper development of any other agricultural branch in this State, and which we have frequently referred to, namely, that there are not enough roads to ship the produce in time.

Lands.—All over the State large areas of lands are not cultivated, notwithstanding the richness of the soil and the irrigation facilities.

The sections in which these lands are situated, are part of large estates, for here, as in the rest of the Republic, the policy has prevailed ever since the epoch of the Spanish Colonization of concentrating excessively large estates in the hands of a few proprietors.

Nearly all the land in the State is in good condition as to moisture; only in some parts along the coast is there need of draining.

The landowners are at present forced to sell parts of their land which they offer at prices which vary from 200 to 300 pesos (100–150 dollars) the hectare; in some instances they ask even more. The unirrigated lands are, as everywhere else in the Republic, cultivated on the share plan, while the irrigated areas are generally kept and cultivated by the owners themselves.

There are some lands, the administration of which is in the hands of the Federal Government: There are 3,000 hectares in Tubares, 1,000 hectares in Palo Verde, 1,000 hectares in San Jose de los Soberanos, 1,400 hectares in Campos, 1,700 hectares in Ojo de Agua, 7,000 hectares in Azacoche and 1,300 hectares in Bay-

mena. It is possible that a careful demarcation of the lands will result in more Government-owned areas.

SONORA

Crops.—Agriculture in this State is typical in many respects, particularly because it is here that most or at least a very large part of chickpeas is produced. Sonora produces more chickpeas than all the rest of the States of Mexico put together. Not much attention is given to the cultivation of beans. As compared with the crops obtained in other States of Mexico that are considerably smaller in extent very little corn is produced. Sweet potatoes, peanuts, "cascalote," sugar-cane, cotton, coffee, wheat, tobacco and a few other articles are also produced in this State.

The chickpea (*cicer arietinum*), of a large and nutritious quality and the principal product of the State yields on an average every year not less than 75,000 tons, a large proportion of which goes to Cuba, Porto Rico, and even to Spain, where the Sonora chickpea is in great favor. It is not so long ago that the cultivation of cotton was started, the annual crop being about 500 tons, part of which serves as a raw material for the different factories established in the State. The soil of Sonora is so adapted to the cultivation of this plant that the latter grows here to the size of a tree, loaded with cotton in the proportion to its size. A little more energy on the part of the farmer and proper irrigation facilities will develop the cultivation of cotton to an extraordinary extent.

Sugar-cane is grown in the open plains of the Mayo and Yaqui rivers, the annual crop being about

4,500 tons, without counting the quantities turned into sugar (1,000 tons), "panocha" or crude sugar (780 tons) and rum (240 tons). This is another cultivation which is just developing. The sweet potato yields 200 tons a year; cascalote, 480 tons; beans, 3,000 tons; tobacco, 340 tons; Irish potatoes, 2,300 tons; corn, 32,500 tons; calabashes, 390 tons; onions, 320 tons; peas (*pisum sativum*), 2,300 tons; red tomatoes, 240 tons; green tomatoes, 410 tons; beets, 250 tons; lentils, 540 tons; horebeans (*vicia faba*), 135 tons; lettuce, 245 tons.

These crops are largely consumed in the local market, the rest being sent to foreign countries, especially the United States. Of the chickpea crop not less than 38,000 tons are exported, while the export of the other products amounts to about one-fifth of the total production.

As we have already stated, the soil of Sonora can produce a great many different plants; it would be profitable to devote some attention to the cultivation of the yucca-plant; that of peanuts should be enlarged; the growing of coffee has been tried with very good results, therefore more land should be devoted to it; then there is plenty of room for the growing of more cotton. "Henequen," or sisal-hemp, should be planted in the low sections on the north-eastern coasts; the same applies to "zapupe," on the banks of the large rivers Mayo, Yaqui, Sonora and Altar; furthermore the "jojoba," which grows very well in the Territory of Baja California, should be planted; just like the peanut, it can be turned into a fine edible oil. Here, as well as in all other hot sections of the country, the growing of alfalfa should be undertaken, as it is an excellent fodder for cattle.

Transportation.—The principal line over which the State of Sonora carries its crops is the Mexican Southern Pacific Railroad which crosses the State in its largest dimension, besides several branch lines that penetrate the territory of the State to some extent. Its principal port is Guaymas, situated in one of the most beautiful and convenient bays of the country; it is the only port of entry of the State; then there is the port of Agiabampo for the coast-wise trade, which also handles a considerable quantity of products.

Horticulture and Orchards.—As a fruit-producing country this State is justly famed; in this regard it is greatly favored by the fact that the United States market is so near at hand.

The Sonora fruit crops are as follows: oranges, 9,000 tons; guavas, 300 tons; peaches, 760 tons; pomegranates, 230 tons; figs, 250 tons; limes, 500 tons; melons, 1,700 tons; watermelons, 8,000 tons; white sapotas, 100 tons; yellow sapotas, 80 tons. Of course, other kinds of fruit are also produced, but in smaller quantities.

More than half of the fruit mentioned above goes to the United States, where it is very much liked.

Fruit cultivation is certainly one of the branches of agriculture which could be still more developed in this State; for this it is above all necessary to make the proper selection of species and seeds. Thus, for example, the seedless orange is generally preferred on the market, therefore the farmers should apply their efforts to producing this kind of orange. As a rule most of the fruit in Sonora could be of a larger size, easily attained, in view of the very excellent soil and the favorable climate that characterize the

State. Horticulture in general and the growing of vegetables in particular should receive more attention on the part of the farmers in the best irrigated areas, since there is a ready market for all that can be produced.

Lands.—Large tracts of uncultivated land are found also in this State, not only in those sections where cultivation is entirely impracticable, but even along the banks of the rivers Yaqui, Mayo, Altar, Sonora and Magdalena. The difficulty is that there are not enough farmers in the State, and the shortage of labor for agricultural work has greatly interfered with the development of Sonora. Most of the uncultivated lands need well-planned systems of irrigation, such as have been built in the region of the Yaqui river and have made possible the cultivation of various crops. Sugar-cane, for instance, grows here as high as ten feet, sorghum grows wonderfully, tobacco reaches five feet, the ramie fiber-plant has prospered whenever it has been planted. The northwestern section of the State is the roughest; there are great sandy deserts where the rivers are lost before they reach the ocean, being entirely absorbed by deep sand. In these areas nothing grows, not even palm-trees, which generally thrive well in sandy ground. A good, systematized irrigation is what is needed. Complete plans have already been adopted for the construction of irrigation works, in which the Federal Government is to spend millions of dollars.

The landowners in this State are as little inclined to sell their properties as in other sections of Mexico, but whenever they do they ask as much as 150 and 200 pesos the hectare in the region of the Yaqui river and in the vicinity of towns and large settle-

ments along the railroad lines; from 50 to 80 pesos, when the land is situated at some distance from the railway, and much less in the rest of the State.

The Federal Government possesses large tracts of land in Sonora. The canceled concession of Mr. Manuel Martinez del Rio has released about 75,000 hectares; furthermore, the Government holds the following lands: In the district of Zetazora, 12,000 hectares; in that of Corral de Espinas, 30,000 hectares; in Chipajora, 28,000 hectares; in San Juan de Madrid, 27,000 hectares; in the Rancho Quemado district, 12,000 hectares. All told, the Federal Government can dispose in Sonora of more than half a million hectares of arable land.

TABASCO

Crops.—The inhabitants of this State devote themselves largely to cultivations peculiar to the tropic zone. Rice, cocoa, coffee, sugar-cane, the yucca-plant, pepper, tobacco, coconut, oranges, the banana species called in the country "roatan," fine woods, etc., are their chief products.

Rice, of which the State might be the principal producer yields some 890 tons a year, several of the other States of the Republic exceeding it in this respect; cocoa produces 2,800 tons of the best grades, exceeded only by the celebrated Soconusco cocoa, of Chiapas. Coffee gives 410 tons; sugar-cane, of which also it might become the first producer in the country yields only 25,000 tons, which is considerably less than in many other units in the Federation; cane juice syrup (molasses), 2,300 tons; "panocha" (crude kind of sugar), 5,000 tons; sugar, 2,500 tons, all of them products of the sugar-cane in-

dustry, and of all of which the State could easily become a great producer, reaping great benefits for the trouble of planting these articles, the very abundance of which would make one forget all the discomforts of the climate and surroundings. Hands are needed to unearth the immense treasures which are buried in the rich soil, and also capital properly handled by enterprising men, to obtain large and splendid results. Corn is also cultivated and gives three and even four crops a year, the species preferred being, as is natural, the large or "irrigated" variety, as the soil and other conditions of Tabasco are not suitable for spare types of corn, which are sown throughout the larger part of Mexico. In this branch of agriculture, Tabasco produces some 34,000 tons; beans yield nearly 8,000 tons; yucca, 325 tons; chile or pepper, 35 tons. We enumerate only those agricultural products that are worth mentioning. The larger part of these is shipped mainly abroad. Considerably more than half of the cocoa is exported. Tobacco, which has been thought to have originally come from Tabasco, of which it bears the name in a corrupted form, offers another field in which the State could be the leading producer. At present it yields about 350 tons of excellent quality, which is sent out of the State.

Many remunerative varieties of cultivation could be introduced into the State, but before everything else it is necessary that those already grown be developed, for which task alone workers are needed. Vanilla, which is growing with so much success in the State of Veracruz, is beginning to claim attention in this region.

Transportation.—The crops grown in this State are transported by the large waterways formed by

its rivers, which will possibly be improved by engineering works so as to make them more useful and extensive.

Horticulture and Orchards.—The fruits produced in Tabasco are most abundant and of unsurpassable quality. The coconut tree yields 1,500 tons; the banana, 16,000 tons; oranges, 600 tons; mangos, 500 tons; plums, 400 tons; and very many others which are scarcely turned to any account; here the same thing happens as in many other States where there are insufficient means of transportation: there is an enormous waste of fruit products. In Tabasco, nevertheless, the non-utilization of the fruit is not exactly due to the lack of rapid means of transportation, but rather to the shortage of workers or, at any rate, to the insufficient activity of the present crop-gatherers. All the fruits grown in the State have a splendid market and can be readily shipped from the port of Frontera, so that the problem is entirely and exclusively one of "hands."

The larger portion of the aforementioned fruits is shipped to other parts of the country and to the United States, especially the banana.

There is no necessity in Tabasco of extending any of the branches of the fruit-growing industry or horticulture. The State yields an immense quantity of wild fruit, which has never been turned to account. The problem is to utilize what is already produced, rather than to further increase the immensely abundant output.

Lands.—The whole State has land suitable for cultivation, and it may be stated with assurance that there is the widest field for every kind of cultivation, for the figures relating to crops show that not a twentieth part of them is made use of. In some

places there are Federal lands, and, according to figures at hand, these cannot be less than 400,000 hectares, suitable for successful colonization.

There is no irrigation problem in Tabasco. Droughts are impossible where streams are so extremely abundant and widespread.

It is not difficult to acquire land in Tabasco, although at present, owing to the discovery of rich deposits of petroleum, the owners attach an entirely new and extremely high value to their lands; namely that of the subsoil.

Owners also rent out their lands; this they prefer to the selling of rich lands which they own. The Government has a large area of Federal land, and although the Mexican people are not in favor of the acquisition of these lands by foreigners, lands can be leased on advantageous terms. The contracts are for long terms, not less than three years, which permits the profitable working of the land.

TAMAULIPAS

Crops.—Agriculture, though not neglected, has not progressed so much as it has in other States of the Republic; the soil of Tamaulipas is, nevertheless, well adapted to many cultivations. Coffee, cotton, sugar-cane, corn, beans, Irish potatoes, sweet potatoes, peanuts, rice, tobacco and sarsaparilla, are the articles to which the farmers in this State pay most attention.

Cotton produces annually, on the average, about 1,000 tons; sweet potatoes, 500 tons; Irish potatoes, 300 tons; corn (the various species of it), 60,000 tons; beans, 3,000 tons; chickpeas, 4,000 tons; rice, 1,400 tons; peanuts, 300 tons; "ixtle" (agave sp.),

6,500 tons; sugar-cane, as such, 4,600 tons, the same turned into sugar, 1,300 tons; "piloncillo" or crude sugar, 5,000 tons; molasses, 600 tons.

Of these products only small quantities of cotton, tobacco, ixtle and rice, leave the State; not less than 400 tons of cotton go to the factories of the State of Veracruz; practically all of the 450 tons of tobacco which the State produces, is sent to the States of Nueva Leon and Coahuila. The other products are consumed in the local market, in fact, they do not even meet the domestic demand, so that very large quantities have to be brought in from other sections of the country. The coffee crops yield about 300 tons, all of which is consumed in the State.

New cultivations which could be introduced in the State are those of the torrid zone; cocoa, vanilla and rubber-trees should be planted in the regions irrigated by the Panuco and Tamesi rivers; the cultivation of cotton should be extended as much as possible; the same applies to chile or pepper which already grows in the State, but is as yet little exploited.

Wheat could be introduced in the northern section of the State, towards the regions irrigated by the Conchos river; the same applies to rye, barley and the cultivation of fodder plants.

Transportation.—The State has various facilities for the moving of its crops: the railroad from Monterrey to Tampico, that from Monterrey to Matamoros, the Panuco river, the steamers on the lagoon, called "laguna Madre" and the large liners that come to the port of Tampico.

Horticulture and Orchards.—Much fruit is produced in the State, especially in the regions irrigated

by the rivers and in the section of the State near the region called the "Huasteca Potosina." The principal fruits are: the aguacate or alligator-pear, which yields about 600 tons a year; red plums, 240 tons; yellow plums, 320 tons; "chicosapota," 90 tons; "chirimoya," 140 tons; peaches, 300 tons; quinces, 200 tons; guavas, 400 tons; mammees, 80 tons; melons, 700 tons; watermelons, 1,200 tons; nuts, 100 tons; Indian pears (*opuntia ficus Indica* and *opuntia leucotricha*), 900 tons; pineapples, 200 tons, papaws, 40 tons.

Most of this fruit is consumed in the State, but some of it is exported to the United States.

The fruit-growing industry should be enlarged as much as possible, since the nearby United States is a splendid consumer. It is claimed that all agricultural pursuits are seriously affected by the tendency to engage in other business activities connected with exploitations of the petroliferous layers. Horticulture is almost totally neglected, so much so that practically all the vegetables that are consumed have to be brought in from other sections of the country, while the State could easily produce three times as much as it needs.

Lands.—These statements prove that there are large areas of land in the State which are not cultivated, many lots awaiting for the engineer to do his perforating work in search of petroleum. The lands are excellent, but the owners would not sell at any price; they rent out some of the land at 150 to 300 pesos the hectare a year. In spite of all this craze for oil, much land could be profitably cultivated, because of the fact that irrigation presents no difficulties in this State.

The Federal Government possesses some 5,000

hectares in the Acuna district. Possibly there are additional lands in the State which in time will be declared to belong to the Government.

TLAXCALA

Crops.—Agricultural activity centers about the raising of corn, beans, wheat, potatoes, chickling-vetch, rye, haricot beans, barley, maguey and certain fruits.

Maguey is cultivated largely, and the pulque-fermenting vats of Tlaxcala have the reputation of turning out good pulque. The pulque-producing area is located in that part of the Apan plains so admirably adapted to the growth of the "agave atrovirens," which here finds the natural conditions under which it thrives best. Tlaxcala produces 125,000 tons of pulque per annum. The "arvejon" (chickling-vetch, *pisum sativum*), yields 760 tons per annum; the bean (*vicia faba*), 1,934 tons; rye, 930 tons; Irish potatoes, 5,200 tons. A small quantity of vegetables is also raised. Corn produces 34,200 tons.

A portion of the products just named is consumed by the local market, and the rest is shipped away. The pulque which is shipped from Tlaxcala may be estimated at 100,000 tons annually; over 4,000 tons of potatoes are shipped, and nearly all the chickling-vetch, the rye and the beans, etc., of which only a very small part goes into domestic consumption. Barley, of which nearly 21,000 tons are harvested, is almost exclusively exported.

The kind of cultivation which is most to be recommended in the State is garden and vegetable produce. Chickpeas, which at present are not cultivated, would

give very good results; the same applies to haricot beans, at present grown to a very small extent, although it is one of the chief food products used by the people; alfalfa might also be cultivated and would have an excellent nearby market.

All of these crops could be raised anywhere in the State, especially in the valleys of Apan, Puebla and Huamantla. In the latter section and in that part of the central region which is watered by the Zahuapan river, large plantations of wheat might be made.

Transportation.—The transport of the crops can be effected by the various existing lines of railways which unite Tlaxcala with the capital of the Republic and with Puebla and Pachuca. The last named city consumes a large portion of the products of Tlaxcala. Some of the crops of this State are shipped from Mexico City and Puebla to Veracruz.

Horticulture and Orchards.—The quantity of fruit gathered in the State is not large, as there are not as many orchards as there might be. It may be said that the present output just meets the local demand, while tropical fruit has to be brought in from other sections of the Republic. Pears, apples, peaches, "chavacanos," quinces, etc., thrive on its soil, although, as already stated, the quantities produced are small.

On account of the proximity of good markets in addition to the local ones, the development of fruit culture would be of great advantage to this State: To be recommended are those of the temperate zone, for which the soil of Tlaxcala is best adapted. The same applies to horticulture in general, which might be extended at will. The large amount of attention at present given to the production of "pul-

que," which yields better returns, prevents the inhabitants of Tlaxcala from making use of their land in the cultivation of other additional products which would add to the wealth of the country, even though they may not give so brilliant results as the pulque.

In Tlaxcala the land has to a large extent passed out of cultivation. On the extensive flatlands only the maguey plant and a little pasturage are grown, it appearing to have never occurred to the farmers to obtain larger returns from their properties—and that without any detriment to the pulque-bearing plants—by planting other crops in the large open spaces between the maguey-plant.

As far as agriculture is concerned, the lands may be divided into two categories; one category contains land which is not irrigated, such as on the flats of Apan and Puebla, and the other is that of the Huamantla valley, which needs to be drained. It is therefore necessary to construct damming-in works, in order to raise the level of the water for the purpose of conducting it along irrigation canals to the points required; water-storage is not needed, as there is plenty of water in the Zahuapan, Atoyac, and other streams which water those valleys. Such public utility works do not demand excessive expenditures of money considering their purpose, nor do they offer any serious difficulties in the matter of construction, as there are quite a number of natural features on this land, such as gorges and glens, in which this could be effected with small expense. In the closed valley of Huamantla, in which is located the lake of Xonacula, into which various streams empty themselves, irrigation would be a somewhat costly undertaking, as it would involve the cutting of tunnels, in the same manner as was done to con-

vey the waters of the Tenango river in the State of Hidalgo down to the large basin in which is stored the water which feeds the falls of Necaxa, the principal electrical power producing plant in the country. It would, however, make available land composed of vegetable mold, whose fertility would make possible large agricultural activities.

The planting of corn in the State is conducted upon the same system as obtains in the rest of the country. The laborers work on a share basis, receiving from the landowner the use of the land, a yoke of oxen, farming tools, the seed and the necessary food for subsistence, the crop being equally divided between them and the landowner or the owner of the crop.

Lands.—It is very seldom that the owners of land in the State sell their land, which is worth about 150 to 200 pesos (75–100 dollars) the hectare where “maguey” grows. Other kinds of land cost less.

There are no lands in the State of Tlaxcala which belong to the Federal Government.

On account of the small size of the State there are no “haciendas” or farms which reach the size of “latifundios” (excessively large landed estates), for which reason we believe that when the property boundaries are revised, there will be no surplus lands worth mentioning.

VERACRUZ

Crops.—The cultivations engaged in in this beautiful region of Mexico are, in a general sense, those that belong to the tropical climate, in the zone of which the State is situated. We have to mention

first cotton, the kind grown on a peculiar tree, known under the name of "pochote" (*eriodendron grandiflora*) and the ordinary species (*gossypium herbaceum*), of which the State obtains but little, in comparison with what the conditions of the soil would permit; 2,000 tons are produced annually, on the average, which is a very limited quantity, very much below that grown in the States of Durango and Coahuila, which have less favorable conditions for the production of corn than the State of Veracruz. The latter, considering its climatic conditions, irrigation facilities, the richness of its soil, could produce at least twice as much cotton as is obtained in the States mentioned above. All the cotton, of course, that is produced goes to the factories and mills of the State. Rice is another article the growth of which could be substantially increased; it yields about 3,000 tons a year, all of which is sent to different sections of the country. This product is chiefly grown in the district of San Andres Tuxtla. Sugar-cane, cultivated in several of the rich districts of the State, yields annually 625,000 tons, not including the cane of which sugar (28,600 tons) is manufactured in the many sugar mills located in different places of the State. In these mills rum is also distilled to the amount of not less than 40,000 tons a year, which, like the sugar, goes mostly to the interior of the Republic and partly to foreign countries. Furthermore, the cane produces also some 35,000 tons of "panocha" or crude sugar, part of which is sent to the interior of the country. Molasses is also made from the cane that is produced. Coffee grows in all sections of the State, but the best grades come from the districts of Jalapa, Cordova, Naolinco and others. Particular attention is given

in Veracruz to the growing of tobacco; the lands which the State has for this purpose could not be better favored than they are as far as conditions of temperature, irrigation, humidity, etc., are concerned. The State of Veracruz yields at least half of the total quantity of tobacco grown all over Mexico, which is partly utilized by the factories established in the State itself, and partly by the large factories located in the City of Mexico; the average yearly crop of tobacco reaches 12,000 tons. Another immensely useful product for which there is a fine market and in the growing of which the State of Veracruz has the monopoly as far as Mexico is concerned, is the vanilla-bean (*vanilla planiflora*), bringing in 230 tons a year, almost all of which goes to the interior of the Republic and partly to foreign countries, where there is a greater demand for this product than can be supplied. The extraction of "chicle," that is the juice from the sapota-tree and which is used in the manufacture of chewing gum, constitutes an important industry in the State; the average yearly crop of this juice is probably more than 1,400 tons. The tree from which chicle is extracted is not the common sapota, but the "chico-sapota" (*achras sapote*). All of this product is exported out of the country, probably all to the United States. There are no industries in Mexico that utilize this product. Sarsaparilla, a medicinal plant for which there is a great demand, grows also in the State of Veracruz, about 200 tons being obtained every year, nearly all of which goes to the interior of the Republic. The other less important agricultural products of the State are the following: corn, which yields annually 161,000 tons, just about enough to meet the local demand; beans, 22,000

tons, for the local consumption; chile, 43,000 tons, exported in the dried state or preserved in vinegar; sweet potatoes, 654 tons; barley, 26,000 tons, used in the industries of the State; yucca, mostly used in the manufacture of starch, 3,000 tons; pepper, 189 tons; wheat, 2,450 tons; calabashes, 4,300 tons; "chayote" (a fruit used as a vegetable), 1,435 tons; peas, 200 tons; green tomatoes, 300 tons. All these latter products must be considered as necessary to meet the domestic demand, nothing worth mentioning being sent away. Cocoa, although not neglected, is not so well attended to as it should be. Some 400 tons of it leaves the State, but considerably more is consumed locally.

All the cultivations we have mentioned could be increased to any desired extent. Of new products it would be advantageous to introduce the cultivation of the sugar-beet particularly in the districts of Tuxtla, Papantla, Jalacingo, but it would also give good results in nearly all other sections of the State.

Transportation.—The State of Veracruz has several railways with which to move its crops, such as the Veracruz-Mexico Railroad (the short line), another Veracruz-Mexico line, via Jalapa, the Cordoba-Santa Lucrecia line; the line from Tres Valles to San Cristobal, and thence to Tuxtilla, from El Burro to San Andres Tuxtla, from the port of Veracruz to Alvarado, the branch line of Huatusco which runs from Cordoba to Coscomatepec, another line from Jalapa to Teocelo, from Puerto Mexico to Salina Cruz. The State has, furthermore, the facilities of the ports of entry of Veracruz, Tuxpan, Puerto Mexico and several ports for the coastwise trade, such as Tecolutla, Nautla, Alvarado and others. Several of its rivers are partly navigable

as, for instance, the Panuco, the Tuxpan, the Papaloapam and the Coatzacoalcos. Nevertheless, there is need of additional means of communication in several places of the State, as Jalacingo which has very rich agricultural areas.

Horticulture and Orchards.—There are all kinds of fruits in this State, the principal of which are the following: the alligator-pear, which produces 7,000 tons; anona, 700 tons; "capulin," 600 tons; plums (two species), 935 tons; coconuts, 3,500 tons; "chicozapote," 5,700 tons; peaches, 600 tons; guavas, 2,350 tons; limes 3,450 tons; mangos, 6,400 tons; oranges, 11,500 tons; pineapples, 2,300 tons; white sapotas, 2,100 tons; black sapotas, 2,000 tons. The quantities given represent those that are exported from the State, the actual yearly production being considerably larger, since much fruit is sold at the domestic markets.

Lands.—Adjacent to the cultivated areas there are in this State also large tracts of uncultivated lands. This is due to the peculiar circumstance, already mentioned in the case of other States, that property was granted in a peculiar way during the time of the Spanish conquest; excessively large estates were formed, with the harmful result that either the lack of labor or insufficient capital prevented the full utilization of the land; this same old system still prevails in most parts of Mexico, so much so that the present Government is conducting an investigation of the official records concerning the large landed properties, their true extent, in order to make available for agricultural purposes the very enormous areas of land held by a few who do not and cannot use them.

Alongside the cultivated lands there are uncul-

tivated areas, in quality equal to the former, and which, therefore, could be devoted to the same crops. Every day, however, the acquisition of land in the State of Veracruz is becoming more difficult, not so much because it is best suited for agricultural purposes, but due to the fact that the subsoil of the State is enormously rich in hydrocarbons. The fact that everybody, individuals and companies, are hunting for petroleum, has possibly one good side to it, as far as agriculture is concerned, namely the desire to obtain lands in the State has caused the careful revision of titles and the resurveying of landed properties described therein. As a result of this considerable areas of land have been found to belong to the Federal Government. It disposes of it only in the form of leases and concessions for petroliferous explorations and exploitations. There are, for instance, the surplus lands in the La Aguada district, some 325,000 hectares in the Isthmus of Tehuantepec, about 10,645 hectares in the district of Tonalapa and in other districts, which now belong to the Federal Government. The riverbeds, the lagoons, the estuaries and the marshes are also the property of the Government. Such places, of course, are of great value to petroleum companies.

The value of land is so high in some districts of the State that the price for leasing it exceeds several hundred pesos a year.

YUCATAN

Crops.—The principal article grown in this State is a variety of the Mexican agave generally known as sisal or sisal hemp; in Mexico it is known under the name of "henequen." Corn, black beans and

sugar-cane are also cultivated in fairly large quantities. The annual yield of sisal reaches as an average 600,000 or 650,000 bales, each bale weighing from 350 to 400 pounds. Sisal being the principal article cultivated by the farmers, the yearly crops of corn, beans and sugar-cane vary greatly. As to corn and beans we must state that the crops vary entirely according to the prices paid for the sisal fiber, for whenever such prices are fairly high, much less labor and land are devoted to the growing of corn and beans than called for by the fact that these two articles form the principal food of the people in general, so that such crops do not always cover the local demand. On the other hand, whenever the market price for sisal is quite low, corn and beans are grown in such quantities as to leave a considerable surplus for a larger raising of hogs and poultry and eventually for export to other sections of the Republic. At any rate it would be a splendid business policy to enlarge the cultivation of these products, since there is sufficient land available for the purpose. The sisal fiber grown in this State is nearly all exported to the United States, a small quantity remaining for the manufacturing, on a small scale, of different articles. Many other articles are grown in this State, but in small quantities, such as tobacco, coffee, plantain, yucca, a variety of sweet potato and Irish potato. The cultivation of the castor-oil plant, cotton (the ordinary and the cotton-tree), white-mulberry trees, grape-vine, especially in the eastern and southern section of the State, would yield good financial results. The same is true of coconut-trees along the coast.

Transportation.—The State has numerous roads to carry the agricultural products to the markets, for

besides an extensive railroad system, the farm-tramways and an extended seacoast with a number of good harbors, there are good roads and highways all over the State.

Horticulture and Orchards.—Among the fruit that grows in the country we have the sweet orange, the sour orange, plantains, bananas, pineapples, alligator-pears, watermelons, cantaloupes, papaws, India-plums, saramuyos, guayas, sapotas, sapodilla-plums, guavas, coconuts, guanabanos (a kind of anona), anonas, nances and tamarinds. But all these fruits grow in such small quantities as to cover the local demand only. The cultivation of some of these fruits could be intensified in certain sections of the State with good financial results, for example, coconuts along the coast, pineapples in the south, and alligator-pears, oranges and lemons in nearly every section of the State. Truck-gardening could also be increased by re-establishing the numerous vegetable gardens formerly existing on nearly every plantation. Land can be easily rented from the owners.

Lands.—There is a considerable extent of uncultivated land all over the State; nearly all of it is privately owned. Different articles could be grown thereon with splendid financial results, according to the particular section of the country; the cost of land is governed entirely by its proximity to railroads. The planting of sugar-cane, corn, beans, potatoes, coffee, tobacco, etc., could be greatly extended in the eastern and southern parts of the State. It would also be profitable to start anew the planting of cotton and castor-oil plants which in the past used to constitute one of the principal gains of this State. In the northwestern section, where

the soil is calcareous and consequently most suitable for the cultivation of sisal-hemp, very good results could be obtained by cultivating coconut-trees and cotton-trees instead of or besides sisal, since they require but very little attention. Nearly every plantation or farm has extensive tracts of uncultivated land, mostly covered with brush or wood which is cut and used as fuel to run the machinery on the sisal plantations. Large or small tracts of such land can be rented from the owners on very easy terms; in many instances they can be had entirely free of charge for the period of cultivation.

ZACATECAS

Crops.—Not all the land of the State is fit for agricultural enterprises. There are arid sections in the eastern part of the State, *i. e.*, the part of the large Salado Valley which is within the boundaries of this State, as well as in the north, in the section comprised within the region called “Bolson de Mapimi.” Other sections of the State, besides those just named, are barren, among others those of Sombrerete, La Capilla, etc. The people of Zacatecas grow corn, preferably the kind that does not require irrigation, beans, chile, sugar-cane in the regions of Juchipila and Colotlan; also potatoes, wheat, calabashes, sweet potatoes and a few other articles.

The cornfields comprise a large part of the cultivated land in the districts of Nieves, Rio Grande, Fresnillo, Chachihuities, Jerez, Villa Garcia, San Andres del Teul and in the vicinity of the city of Zacatecas and Pinos, and annually produce an average of 121,500 tons which are consumed in the State. But this quantity does not cover the demand

of the local market; the balance needed is brought in from the States of Durango and Aguascalientes. Beans produce 10,600 tons a year, which is insufficient to meet the local demand and is supplemented with beans from other parts of the Republic; chile brings 3,200 tons, consumed in the State; sugar-cane, 2,800 tons; "piloncillo" (crude sugar), 4,000 tons, partly consumed in the State and partly exported to the States of Durango, Aguascalientes and San Luis Potosi; potatoes, 580 tons, for the local market; wheat, 4,000 tons, turned into flour in the mills of Zacatecas; calabashes, 200 tons; watermelons, 200 tons and sweet potatoes, 785 tons, partly exported to the States of Aguascalientes and Coahuila.

The southwestern section of the State is suitable for the cultivation of cotton and the grape-vine; the "guayule" shrub could be planted in the regions of Pinos, Nieves, Mazapil, and Sombrerete. Unfortunately the people here follow the same practice as in the State of Durango, that is to say, they pull the plant together with the roots. Those that benefit by this system of gathering are the buyers of the plant, the roots of which contain more rubber than the rest of the plant, but the land is not so easily covered again by new plants. The castor-oil plant grows well in this State.

Transportation.—For the moving of its crops the State has the services of the Central Railroad and the railway from Canitas to Durango. The southwestern section of the State which is the richest, has no rapid means of communication at all; all the transportation here is done by means of carts and pack-mules.

Horticulture and Orchards.—The State produces peaches which yield on an average about 500 tons

a year; guavas, 480 tons; apples, 100 tons; quinces, 215 tons; oranges, 360 tons; pears, 725 tons; "peron," 340 tons; prickly-pears, 2,000 tons; grapes, 300 tons; nuts, 80 tons. Nearly all of this fruit is consumed in the State. Horticulture as well as the growing of fruit could be extended and intensified in this State, with the advantage that the State itself would offer a good market for the produce; in addition, outside markets could be found.

Lands.—The State possesses extensive tracts of uncultivated land, not only in the barren sections we have mentioned before, but also in the fertile valleys of Valparaiso, Jerez, Juchipila, San Andres del Teul, where not even one-third of the land is utilized despite the richness of the soil. These lands are particularly suited for the cultivation of sugar-cane, grape-vine and fruits. To this end water-basins should be built on a level high enough to make possible the irrigation of the land; at the same time the waters from the wash-outs would be taken advantage of, while at present they are completely lost in the Santiago river which carries them to the Pacific.

The value of the land varies according to conditions. Scarcely anything is offered for the barren lands; the non-irrigated land is worth less than 20 pesos (ten dollars) the hectare in sections far from the railroad and about 40 pesos in those sections that have these facilities. In the southwestern region where the land is rich it does not cost much, on account of being distant from railroads, the land-owners being ready to sell even at 50 pesos the hectare.

It is not exactly known whether the Federal Gov-

ernment possesses any land in this State, though it is generally believed that it does not. It is, however, possible that a careful survey of the large properties and the examination of the corresponding titles will result in the passing of portions of land in the different sections of the State into the hands of the Government.

CHAPTER III

FORESTS

The thorough exploitation of the forests in the different sections of the Mexican Republic represents without any doubt one of the most promising fields for the investment of foreign capital. These forests contain immense treasures in the form of wood of all kinds, the most durable timber for construction purposes and the most beautiful species for the cabinet-making trade, and furthermore, a great variety of medicinal plants, some well known and others less known to the medical profession outside of Mexico.

All matters concerning the national forests of Mexico are administered by the Department of Agriculture and Development (Secretaria de Agricultura y Fomento) in Mexico City. All parties interested in the exploitation of the forests of Mexico must address this Department of the Federal Government.

In the following pages we present a complete survey of the forests in every State and Territory of the Mexican Union. As in the case of the agricultural products, we give in most instances the names of the trees under which they are known in Mexico, for the reason that the English translation of the names of such trees, plants and fruits found in books and dictionaries seldom corresponds to what the local names indicate. This is probably due to the fact that the nomenclature of the Latin-American

Flora varies greatly according to the different sections or countries. Even such familiar terms as "pine," "oak," etc., do not always represent the tree which is known under that name in the English language. Therefore we have thought it necessary to add in most instances the corresponding botanical names, of which there is a complete alphabetical list at the end of this book.

The total extent of the forests distributed all over Mexico is given by some as 150,000 hectares, by others as 250,000 hectares. The figures, however, are by no means reliable.

AGUASCALIENTES

The western portion of the State is covered with large forests in which there are oak, pine and cedar, these being utilized in the following annual proportions: oak, 2,300 tons; pine, 200 tons; cedar, 100 tons. In the central and eastern plains of Aguascalientes "mesquit" is found, which is generally used domestically as firewood to the extent of some 500 tons; "huisache," 130 tons; and others for the same purpose. Willow is found along the banks of the rivers and yields 620 tons annually.

Transportation—There are no convenient transportation lines for lumber, as the railway routes are towards the center and east. Lumber has to be transported along roads; as none of the rivers can be used for the purpose.

BAJA CALIFORNIA

This Territory is not very wooded, at least not in all of its sections. The lands, on the whole, have

the appearance of barren stretches, although in the sections well irrigated by the sporadic torrential rains there are woods; this is the case in the south, west, and in some regions of the east of the Territory. Oak, which grows on the heights of the "Sierras Costaneras" (mountain ridge along the Pacific coast), crossing the Peninsula from south to north, is abundant, and from the woods that are not far from the populated centers, about 2,300 tons are obtained. Mesquit (*prosopis juliflora*) which is well adapted to the climate, yields more than 14,500 tons a year; it is mostly used as fuel. The "palo blanco" (*forrestiera phyllicoides*), produces 23,600 tons; "palo colorado" (*quercus virens*), 2,300 tons; "camachin" (*ficus fasciculata*), 100 tons; another species called "palo blanco" (*lysiloma candida*), the bark of which is used for tanning purposes, 580 tons; "palo de brea" (*circidius unijuga*), 300 tons; "torote" (*bursera microphylla*), 240 tons; a good and useful gum is obtained from this tree. Small quantities of other species are also exploited.

Transportation.—The timber industry has only one facility: the relatively short distance of the forests from the coast. The condition of the rivers is such as to preclude their use for the transport of timber, nor is the existing railroad line of any service for this purpose. The ocean is the only route available for transportation.

CAMPECHE

Nearly all of the interior of the State is covered with extensive forests, generally called "montana" by the natives of the country. The largest forests

are found in the Districts of Los Chenes and El Carmen. They contain most precious woods suitable for construction and cabinet-making purposes. There is the "chacte" or ironwood which is of great renown. The ancient Maya Indians knew its value and excellence, having used it for the construction of the doors in the palaces of Uxmal and Chichen-Itza, the artistic workmanship of which has been admired for centuries. Mahogany, cedar and "jabin" are woods found in abundance everywhere in the State. Then there is the well-known Campeche-wood which by itself forms enormous forests; the sapota-tree, from which is extracted the gum used in the manufacturing of chewing gum; then there are large sections of the State covered with a species of tree called "ramon" in this section, and "ojite" in other parts of the Republic; the leaves and fruit of this tree make a splendid feed for cattle and hogs. Some thirty years ago the exploitation of the sapota-gum or "chicle" was started in this State, and the general belief was that soon there would be an end to the trees; but no such thing has happened, for the Federal Government is still granting concessions for the extraction of the gum. This proves that there is still an extensive field for this industry which seems to be a splendid investment commercially.

Transportation.—As for facilities for shipping the products of the forests, there are in the Districts of the Capital of the State, Los Chenes and partly in the District of Chapoton, cart roads that are of use only during the dry seasons of the year. The construction of a regular cart road is planned which, extending over a distance of 150 kilometers, would make possible speedy and easy communication be-

tween the city of Campeche and the principal towns and villages and the District of Los Chenes. The District of El Carmen is crossed by numerous rivers used as regular routes of traffic. The real exploitation of the immense riches contained in the forests of this State, will take place, as soon as the contemplated construction of the so-called "Southern Railroad" shall have materialized; this road would connect the Capital of the State with the City of Mexico.

CHIAPAS

With the exception of a few localities along the coast and the section which is called "interior," the whole of the State is covered with forests, many of them almost impenetrable. The number and variety of woods for carpentry, cabinet-making, building, fuel, etc., are enormous. Forests which no one has ever touched offer their inexhaustible riches; dyewoods, medicinal plants and other great resources at the present time go to waste in these forests.

So that in Chiapas, as far as timber is concerned, it is the same as with fruits: a very small part of it is used. The difficulty of utilizing timber is accentuated by the absence of suitable roads. Mahogany is exported to the extent of about 1,200 tons a year; cinnamon, 400 tons; cedar, 6,000 tons; evergreen oak, which is used almost exclusively to meet the domestic needs of fuel, 24,000 tons; hawthorn yields 980 tons; "ocote," or torch pine, 7,500 tons; fir tree, 1,200 tons; pine, 5,000 tons; "roble" (a species of oak), 6,700 tons. Smaller quantities are taken out of various tropical trees, such as palisander, "quiebrahacha," "liquidambar," rosewood,

etc. There is also the "palo del moral" (berry-tree), the "curcuma" or turmeric (dyewood) and many other kinds.

Transportation.—There are ample means of getting these woods out, such as the rivers which flow towards the Gulf of Mexico and some rivers which carry their waters towards the Pacific. The Pan-American Railroad is a very effective means of shipping these woods, and connects with ports such as San Benito, Tonalá and Soconusco where the lumber can be put on board, especially for the United States, which in the future will be a large market for the important timber products of Chiapas and of every other kind of products grown in that State. A few branch lines of railroads, a few automobile roads, such as are now being constructed, will solve the problem of the utilization of the products of the State of Chiapas.

We have refrained from giving a complete list of the very many different kinds of timber in the State, but we may say that there are enormous quantities of great variety.

CHIHUAHUA

In the western section of the State, in the mountains as well as on the high table-lands and in the valleys formed by the mountain chains, the forests are particularly rich in construction timber, such as pine, oak, "madrono," "manzanilla" and others. In the central valleys the forests contain chiefly "huisache," mesquit, "chaparro" and some other species. Along the river banks the "sabinos," willows, poplars, ash-trees, tamarisks,

osiers (*salix viminalis*), etc., form considerable forests.

At present the forests are very imperfectly exploited, due to the serious difficulties which are met with in the transportation of the timber, on account of the great distances of the forests from the railroad lines and the rugged nature of the land covered with such forests.

The figures of the average annual production are: "ahuehuete" (*taxodium mucronatum*), 1,400 tons; poplar (*populus monilifera*), 7,800 tons; "brasil" (*caesalpinia* sp.), 2,000 tons; oak (*quercus*), 34,000 tons; mesquit (*prosopis juliflora*), 12,300 tons; pine (several species, such as *pinus moctezumae*, *pinus pseudostrobus*, *pinus cembroides*, *pinus osteoperma*), 123,400 tons; willow (*salix bomplandiana*), 1,200 tons; tamarisk (*salix taxifolia*), 300 tons; "chaparro" (*mimosa* sp.), 2,500 tons. Smaller quantities are obtained of other trees.

Transportation.—The exploitation and transportation of the woods that are used for fuel purposes is easy, since the product, the charcoal, is brought out of the forests and carried to the market or the railroad on pack-animals, mostly mules and donkeys; but when it comes to shipping large pieces of lumber, such as are used by constructors and cabinet-makers, the matter is quite different and generally very difficult, due to the total absence of roads that cross the forests where large quantities of timber are found. The roads that at present are used for transporting timber are: the Mexican-El Paso railroad line; the Kansas City, Mexico and Orient line and Jimenez-Rosario line. The rivers can also be utilized for the purpose, especially during the floods of the rainy season.

COAHUILA

The greater portion of the State of Coahuila lies within the immense region known under the name of "Bolson de Mapimi" which includes also part of the State of Durango, the whole eastern section of the State of Chihuahua and extends to New Mexico and Texas in the United States. This region has little vegetation, although in the less barren sections the mesquit and "huisache" grow. The annual exploitation of mesquit is given as 18,300 tons and that of "huisache" as 87,000 tons. The high sierras of Coahuila (La Paila, El Carmen, Sierra Mojada and others) possess, especially the first two, large forests of oak and pine, of which 2,800 and 600 tons respectively are obtained every year. These same forests contain also "madrono" and "oyamel" (Mexican sacred fir), the former yielding 590 tons and the latter 4,000 tons a year. The State, furthermore, produces 1,700 tons of poplar, 3,800 tons of cedar, 600 tons of "ahuehuete" which grows along the rivers Sabinas and San Juan, 2,300 tons of beech-tree and 590 tons of ash-tree.

This State, compared with other States of Mexico, has practically no forests at all, and those that are found are not of the importance of the forests situated in the States of Durango, Chihuahua, Sonora, Sinoloa, Tabasco, and others.

Transportation.—The State has fairly good railroad facilities for the moving of its timber. None of the rivers in Coahuila are of any service in this regard, because at no time of the year do they carry sufficient water.

COLIMA

The entire State of Colima represents one solid forest in which there is a great variety of trees, yielding wood for construction purposes and cabinet-making, and fruits of all kinds.

There is no exploitation of the forests of Colima, for the small quantities of timber that are taken out of them, do not deserve to be called so. The average yearly production of timber from the forests in this State is, all told, about 2,600 tons a year, distributed as follows: ebony (*diospyrus ebenaster*), some 400 tons; mahogany (*swietenia mahogani*), 200 tons; ash-tree, 200 tons; balsam-tree, 100 tons; and other classes of trees in the same proportion. The exploitation of the rich forests in the State of Colima alone is a splendid business opportunity.

Transportation.—The timber product of the State could be shipped by railroad lines that are already in operation and exported by the maritime roads. Furthermore, all the rivers of Colima can easily be converted into excellent routes for the transport of timber to the coast.

DISTRITO FEDERAL

The reasons assigned to the fact that the Federal District is not producing enough in the agricultural field hold true in the case of forests as well. The territory of the District is too small to have large wooded areas, the products of which could cover even in part the demand for wood in the different industries. There are some forests in the districts of the Ajusco, Las Cruces and in other sections, but

these are scarcely exploited, due to the fact that the Federal authorities prohibit the cutting of trees in forests that are still in existence. Probably not more than 300 tons of "ocote," and some 400 tons of "oyamel," as an average every year, are brought in from the forests mentioned; furthermore, a considerable quantity of oak which is turned into charcoal and sold at the markets of the City of Mexico and other towns of the District is imported.

Transportation.—The Cuernavaca road is the principal route by which timber is shipped; the San Rafeal-Xico railroad line is frequently used for the same purpose.

DURANGO

The forest-covered section is that of the Sierra Madre Occidental, which is rich in coniferous trees and oaks; in the valleys of Guadiana, Guatimape, Santiago Papasquiario, Suchil, Poanas and the Steppes of Cuencame, "huisaches" (acacia tortuosa) and mesquits are abundant; in the region of the ravines (Mezquital, Pueblo Nuevo, San Dimas, Tamazula and part of Santiago Papasquiario) there is an abundance of precious woods.

Durango exploits its timber resources to the following extent annually: ash (*frazinus virides*), 600 tons; "huisache," 7,000 tons; pine (the species *pinus ayacahuite*, *pinus pseudostrobus* and *pinus patula*), 30,000 tons; poplar (the two species *populus monolifera* and *p. canadiensis*), 3,200 tons; "madrono" or strawberry-tree (*arbutus varians*), 200 tons; willow, 800 tons; oak, various species, 44,000 tons; mesquit, 20,000 tons. The major portion of this timber is shipped to various parts of the Republic. The richest forests are those of La

Borrega, La Guitarra, Guarisamey, Llano Grande and that on the Sierra de Michis.

Transportation.—A large quantity of the timber is shipped by rail to Llano Grande. From this line there is a special spur to the "Guitarra" section for the moving of lumber; this lumber can be sent to Torreon by the Ferrocarril Internacional (the International Railroad) and to Aguascalientes by the Canitas branch line. The branch to Tepehuanes also carries a considerable quantity of lumber. None of the rivers of the State can be considered, either at present or in the future, of use to the timber trade.

GUANAJUATO

This State, mountainous in the central and other sections, has in the sierras as well as in its large valleys and plains, especially in the regions too far away for the agricultural industry, forests which contain building and cabinet-making wood in particular. In the sierras various species of pine trees abound, of which about 1,500 tons are obtained, mostly all of which is used in the State in the building industry; oak produces on the average more than 17,000 tons, mostly consumed at home and partly in the manufacture of carts and other objects; "madrono," 670 tons, also used as fuel; "huisache," 100 tons partly used as fuel and partly for the making of hubs of wheels; oak, 3,000 tons, consumed in the form of charcoal and in carriage-making industry; willow, 60 tons. Poplars have been planted on both sides of public walks and on some roads as inclosures of cornfields; the same applies to ash-trees and "sabinos," the latter being most frequently found along the banks of the rivers; in some places

there are solid forests of these trees; the mesquit tree yields about 30,000 tons of wood, practically all of which is turned into charcoal. In the flat sections of the State there are whole forests of this tree.

True enough, the State of Guanajuato has not the forest wealth of other States, but there is no want of timber. Especially towards the south of the State are there splendid forests with fine woods that have never been exploited.

Transportation.—The railroads of the State render excellent service in the matter of carrying the timber from its forests, and some of the rivers can be utilized for the same purpose during the rainy season. The State, furthermore, has good cart roads which help maintain fairly good communication with the different towns and villages of the State and which pass through forests that can be exploited. The carts are generally used for bringing in fuelwood and charcoal. In general it is not a difficult matter to establish roads in the very extensive flat sections of the State.

Real exploitations of the forests have not as yet been started, and most of what is gained from them is used in the State itself; very little is exported.

GUERRERO

This State is also extremely rich in forests, although it has to contend with the extreme difficulties of getting the products to markets that would be glad to have them. Immense virgin forests, from which scarcely any timber has been taken for the building of houses or for fuel, are to be found along the numberless mountain ridges separated from the huge mass of the Sierra Madre of the South, in which

there are very high elevations, such as the "Puntas de la Tentacion," and the "Tetas de Coyuca," and enormous forests in the valleys surrounded by other mountain ridges. These forests contain timber suitable for cabinet-making, carpentry and the building industry and for fuel purposes. In the elevated sections coniferous trees and oaks are found; in the valleys, the deep passes and hollows and on the slopes of the sierras ebony, mahogany, rosewood (palo de rosa), "lecherillo," "ramoncillo," tepehuaje," "liquidambar," etc., etc., abound. The principal trees, especially those already exploited, and the average annual output are the following: "pino anacahuita" (*pinus ayacahuite*), 2,000 tons; "caca-huananche," 1,000 tons; cedar (*cupressus benthianiana*), 800 tons; "espino," 8,000 tons; "copal" (*bursera jorullensis*), 235 tons; oak (*quercus* sp.), 8,900 tons; "guaje" (*lagenaria vulgaris*), 300 tons; "ocote" (*pinus* sp.), 7,800 tons; "palo dulce," 200 tons; oak (*quercus*,—a species different from the one mentioned by the same name), 4,000 tons; "tepehuaje" (*acacia* sp.), 4,300 tons. All this timber, with the exception of that which is used for fuel and in construction, is exported from the State. In the forests of this State there is an abundance of other kinds of fine woods, such as "piru" (*schinus molle*), "palo de Corps," "tecomaca," "palo mulato" and many others.

Transportation.—There are no facilities for the removal of timber, at least as far as railroads or highways are concerned. Nevertheless, the rivers, especially the Balsas, the Papayo, the Tepecaocuila, and others could well be utilized for shipping the timber to the seaports; up to the present time this has not been done, for no other reason than the lack

of interest and the proper spirit of enterprise among those engaged in timber-cutting in the forests of the State. But even with the use of the roads the transportation problem in connection with the exploitation of the forests in the State of Guerrero demands a solution none the less.

HIDALGO

Notwithstanding the facility with which the State of Hidalgo can find a market for its timber, it does not work the forests actively, and to a much smaller extent than the State of Mexico, which has taken advantage of so magnificent a market as the City of Mexico. The principal woods obtained from its forests are "ahuehuete" (*taxodium mucronatum*), which yields about 800 tons a year on the average; aile (*alinus*), 1,600 tons; poplar, 500 tons; cedar, 5,000 tons; "chijol," 1,000 tons; oak (*quercus* sp.), 13,000 tons; juniper tree, 300 tons; hawthorn, 200 tons; beach, 270 tons; "huamuchil" (*phitocolobium dulce*), 800 tons; mesquit, 2,300 tons; mulberry-tree, 1,500 tons; "ocote" (a kind of pitch or torch-pine), 34,000 tons; "oyamel" (sacred fir), abeto or pinabete (*abies religiosa*), 7,000 tons; rosewood, 700 tons; dragon's blood, 900 tons; willow, 500 tons.

The forests contain an immense quantity of woods, especially the forests in the section called the Huasteca Hidalguense. It may be said that the timber is not made use of, although it could be made a source of wealth.

Transportation.—The means of communication cover only a portion of the State, and are completely lacking in other parts. The "Huasteca" region has

no roads. But some of the rivers there, such as the Tula, the Moctezuma and the Amajaque, could be utilized to convey the lumber to Tampico.

JALISCO

There are forests in different parts of the State. Those to be found along the border of the States of Colima and Michoacan and in the proximity of the coast contain very useful and beautiful timber for the carpentry and cabinet-making industries; those in the region of Colotlan and Huejuquilla contain also woods of the above description, but most of their vegetation belongs to the temperate zone, and the forests of the section of the State known as the "Bajio" have trees which belong exclusively to the temperate zone. The timber is exploited at present and the average yearly production of it is as follows: ebony, 200 tons; "ahuehuete" (*taxodium mucronatum*), 1,800 tons; poplar, 2,000 tons; "brasil" (*caesalpinia* sp.), 1,780 tons; mahogany, 1,200 tons; cedar, 3,400 tons; "copal" (*bursera jorulensis*), 200 tons; oak, 250,000 tons; ash, 5,100 tons; "granadillo" (*pasiflora edulis*), 120 tons; "guayabillo," 2,300 tons; "guayabo" (*psidium pomiforme*), 600 tons; "huamuchil," 2,200 tons; "huisache," 2,135 tons; "laurel" (*laurus cerasus*), 300 tons; "madrono," 2,900 tons; mesquit, 7,000 tons; orange-tree, 300 tons; walnut-tree, 950 tons; "ocote" (*pinus teocote*), 567,000 tons; "palo blanco" (*celtis occidentalis*), 100 tons; "palo dulce," 2,300 tons; "palo de rosa" (*cachlospermum hibernoides*), 800 tons; "parota" (*enterolobium cyclocarpum*), 500 tons; "pinabete" (*abies religiosa*), 3,000 tons; pine (different kinds), 175,600 tons;

oak (*quercus* sp.), 225,000 tons; willow, 1,400 tons; "tepehuaje" (*acacia* sp.), 6,500 tons; "tepemezquite," 100 tons; "tepozan" (*buddleia humboldtiana*), 40 tons; "hobo," 50 tons; "amapa," 60 tons; "una de gato," 100 tons. Smaller quantities are obtained of the following: alder-tree, "alamillo," alligator-pear tree, "capomo," "capulin," "colorin" (*erhytrina corallodendron*), "colorin chiquito" (*rhinchosia precatoria*), "guasima" (*guazuma polibotrya*), "garabato" (*pisonia hirsuta*), etc. The wood of the "colorin chiquito" is used in the cork-making industry.

Transportation.—The roads for hauling these timbers are the existing railroad lines and some high-roads; transportation by the latter, being slow, is quite expensive. Some of the rivers can be utilized, especially those that run from north to south; wood could be floated on these watercourses to the Lerma river which would carry them to Guadalajara.

MEXICO

The State of Mexico has large and beautiful woodlands. As they are located in the fertile valleys of Mexico and Toluca, the forests cover the entire State, with the exception of limited plains in the higher portions of the Toluca Valley. The region of the Valley of Bravo and in general that of the south are rich in tropical vegetation, equal to that of the States of Michoacan and Morelos.

In the south high grade lumber plays an important part in the economic life of the territory; there are mahogany, cherry, quiebrahacha (*axebraker*) and many other species, scarcely being exploited because of the lack of transportation facilities. In addition,

the following quantities are obtained: 160 tons of "ahuehuete"; 1,640 tons of aile; 5,500 tons of cedar; 38,000 tons of oak; 150 tons of ash-tree; 4,689 tons of "huisache" (kind of cypress); 7,300 tons of wild cherry; 28,480 tons of "oyamel" (fir tree); 170 tons of stone-oak; 512 tons of "tepehuaje."

Transportation.—The above timber is sent by rail principally to the City of Mexico. Unfortunately, it is impossible to make use of the rivers for the purpose of floating the lumber to any point desired; the southern water-roads would carry their floats in an opposite direction.

MICHOACAN

The State of Michoacan is one of the States which, if not possessing forests of the same degree of luxuriance as those of the State of Tabasco, are most liberally endowed with them. The southern portion is covered with valuable woods, the mountains in the central part have immense quantities of timber suitable for building purposes; "huisache" and mesquit are plentiful in the valleys. The whole State contains forests which are exploited only in those sections which lie nearest to the railway lines.

On the Southern Plateau none of the timber of the tremendously rich forests of this region has been taken out, nor can it be, as long as means of transportation are lacking.

The timber obtained in Michoacan is as follows: "ahuehuete," of which 1,200 tons annually are used: Brazil-wood, 1,100 tons; mahogany, 400 tons; "capulin" (*rhus virens*), 290 tons; cedar, 1,640 tons; copal, 1,180 tons; evergreen-oak, 42,300 tons; ash,

1,700 tons; red ebony, 100 tons; "huamuchil," 3,200 tons; "huisache," 100 tons; strawberry-tree, 8,000 tons; mesquit, 10,000 tons; walnut, 1,180 tons; torchpine, 27,200 tons; sacred fir, 49,000 tons; "palo blanco," 1,000 tons; "palo dulce," 152,000 tons; "palo prieto," 200 tons; "parota," 2,500 tons; fir, 5,000 tons; pine, 254,000 tons; oak, 7,000 tons; willow, 26,000 tons; "tepehuaje" (a hardwood), 5,800 tons. A much larger quantity of these woods could be cut without injury to the forests. There are at present a few estates which are beginning to exploit their timber lands, among which may be mentioned one called "Cortijo," which has good sawmills.

Transportation.—We can only repeat that the only reason why the woods are not utilized to a greater extent is because railroads are lacking. The rivers, although they have plenty of water, have all the same defect, namely: they flow in the opposite direction to that which is needed.

MORELOS

This small State of the Mexican Union is noteworthy for its forests which contain all kinds of timber. In the high sierras of the State (Ajusco, Tlaltizapan, Popocatepetl, etc.) there are large quantities of conifers, the most excellent of which are the "oyamel" (*abies religiosa*), different kinds of pine, oak, "madrono" and others; in the warm valleys irrigated by the Amacusac river and its tributaries we find mahogany, ebony, quiebrahacha and other species in very large quantities. These forests, however, are not exploited in a scientific way.

The quantities of timber which the State of More-

los obtains from its forests are estimated as follows: amate (*ficus nymphaeifolia*), 6,800 tons; oak, 17,900 tons; "madrono," 5,670 tons; ocote (*spinus* sp.), 42,000 tons; "oyamel," 980 tons; quiebra-hacha, 100 tons. Smaller quantities are obtained of other varieties.

The principal market for these woods is the City of Mexico.

There are in the State many other species of trees that can be commercialized, as we shall explain in another chapter of this book.

Transportation.—Properly speaking the State has not many facilities for the hauling of timber. The two railroad lines are far away from the region where the forests are located. The rivers, on the other hand, are of no use, not because they do not carry sufficient water, but because their current would carry the timber in a direction opposite to that desired.

NAYARIT

This State, like others that have no serviceable means of transportation, possesses large forests, from which scarcely any wood has been taken. There are in these forests fabulous quantities of timber suitable for every purpose, and the systematic exploitation of which would constitute an inexhaustible source of wealth.

At present, notwithstanding the lack of proper roads, fairly large quantities are obtained of the following timbers: "palo dulce" (*eysenardtia*), 135 tons; "pinabete," 45,000 tons; oak, 75,000 tons; mesquit, 11,600 tons; cedar, 56,700 tons; pine (the species *pinus pseudostrobus*), 64,500 tons; "madrono," 12,000 tons; walnut, 3,000 tons; ebony,

200 tons; "amapa" (*tabebuia*), 1,000 tons; quiebrahacha (*hymenaea* sp.), 100 tons; "palo de fierro" (*byra ebenus*), 200 tons; "palo mulato" (*simaruba*), 90 tons; "ocote" (*pinus teocote*), 60,000 tons; "nazareno" (*brosium alicastrum*), 300 tons; "hobo" (*spondias lutea*), 200 tons; "huevo de gato," 160 tons; "cocoito" (*robinia* sp.), 100 tons; "cahua" or "palo Maria" (*achras* sp.), 120 tons; "jabin" or "tuzohe" (*piscidia erytrina*), 80 tons; "aguacatillo" (*persea gratissima*), 100 tons. Other species are cut in smaller quantities.

The "Islas Maria" (Mary Islands), considered a part of this State, have large forests containing woods that are of great value.

Timber for cabinet-making and carpentry is found in the deep passes and on a strip of land along the coast, from 50 to 60 kilometers wide, and on the Maria Islands. Timber suitable for construction purposes is found in the sierras of Nayarit, Alica, Ceboruco and in other sections.

Transportation.—The timber we have mentioned is shipped by the Southern Pacific Railroad of Mexico with its branch line to Tepic, and on the vessels that touch at the port of San Blas on the Pacific.

Practically all the rivers of the State offer great facilities for the transportation of timber, for those that flow into the Santiago river bring the timber to the port of San Blas, and the timber that comes down the San Pedro and Acaponeta rivers reach the mouth of the Comichin, from where it can be shipped on board.

Among the products that could be shipped that way, we mention mahogany, of which at present 500 tons are sent out; Brazil wood, of which 12,000 tons are shipped, and a few other species of timber.

Rubber (*castilloa elastica*) is also being shipped on an average of some 30 tons a year.

NUEVO LEON

The region south of Linares has forests with woods of the torrid zone; in the central and northern sections of the State the woods are those that belong to the temperate zone, and in the sierras the trees are those of the cold climate.

At present the following varieties of timber are exploited: "ahuehuete," 700 tons; poplar, 870 tons; alder (*alnus glabrata*), 200 tons; maple (*acer compestris*), 100 tons; "aile" (*alnus acuminata*), 230 tons; "brasilete" (*caesalpinia brasiliensis*), 3,000 tons; "chaparro prieto" (*mimosa* sp.), 2,500 tons; cedar, 3,400 tons; "chamal" (*dioon edule*), 180 tons; oak, 9,800 tons; "huisache," 3,100 tons; mesquit, 4,200 tons; pine, 8,600 tons; "ocote," 600 tons; "guayul" (*vauquelinia corymbrosa*), 100 tons; "granjeno" (*celtis pallida*), 800 tons; "garabato" (*pisonia hirsuta*), 900 tons; willow, 450 tons; walnut, 200 tons; ash, 400 tons; "madrono," 800 tons. Smaller quantities of other species, such as "manzanilla" or "pinguica" (*arctostaphylus pungeus*), "encinilla" (*croton dioicus*) and others, are also obtained.

Willow, ahuehuete, pine, cedar, brasilete, arce, aliso, poplar, walnut, and ash are used by carpenters and cabinet-makers; all other kinds of timber are consumed in the form of charcoal.

Transportation.—For the hauling of timber there are the railroad lines and a few cart roads; also minor roads over which the charcoal is carried on pack-animals. The principal market is the city of

Monterrey. The State of Nuevo Leon does not export any of its timber, while on the other hand it has to import considerable quantities for its furniture manufactories and other industries.

As the rivers of the State carry, as a rule, little water, they cannot be utilized for the hauling of timber to convenient places.

OAXACA

The forests of Oaxaca are vast and luxuriant. Woods of all kinds are met with, among which may be mentioned the following: mahogany, of which 680 tons are cut; the evergreen oak, 47,000 tons; ash, 640 tons; mulberry, 345 tons; torch pine, 6,000 tons; "palo de Corps," "palo mulato," "tecomaca," "palo ramoncillo," "palo santo," "guasima," "palo dulce," "solenillo," "paracata," "frijolillo," "ocotillo blanco," "bari," "palo gusano," "alanchon," "mahuate," yellow laurel, ebony, "nazareno," "chachahuate," "soco," "zopilote," "palo de arco," and many others which are used mostly for cabinet-making and carpentry, and are, like many other species, little known and little exploited. There are vast forests of construction timber including various kinds of pine, oak, evergreen oak, strawberry-tree, etc., etc., none of which is utilized to the extent that the abundance would permit.

Transportation.—The small extent to which the forests are worked is due to the lack of roads. The rivers, on the other hand, do not lend themselves very well to being instrumental in floating the timber from the forests and depositing it at any desired point. The Mixteco river and some of its confluents could be used to carry the lumber as far as the

Puente de Ixtle, at which point the railway crosses the stream; from there onwards the river would not take the timber in the right direction; improved by some small engineering works, the river Papaloapan and several of its confluent, such as the San Juan and the Tehuacan, could be utilized in the same way as far as the lake of Alvarade in the State of Veracruz; the Tehuantepec, the Verde, and the Omo-tepec could be similarly used to carry the timber to the Pacific.

PUEBLA

This State being situated in the torrid zone, its forests are rich in fine woods, part of which is utilized in Puebla itself. Its sierra of Zacapoaxtla contains enormous riches, and its forests along the banks of the rivers Mixteco, Atoyac, Mexcala, Petlalcingo, Nexapa and others abound in trees of different species. There are also large forests on the slopes of the sierras of Nevada (Sierra Nevada), Tlaxco and Monumentos which contain woods belonging to the cold regions: pines, oaks, yew-leaved firs, etc.

The wood production of the State is estimated as follows: alligator-pear tree, 2,000 tons a year, on the average; this wood is considered to be fine and suitable for cabinet-making; "ayacahuite," 1,200 tons, generally used as board wood for packing purposes, ordinary furniture, rafters, etc.; "aile," 12,000 tons; poplar (*populus monilifera*), 570 tons. The so-called "Belloc coal" has already become popular in medicine; it is manufactured from the bark of this species of poplar and used with considerable success as a disinfectant; "amate," 380 tons; mahogany, 1,200 tons; cedar, 1,400 tons; "chicosa-

pota," 340 tons; oak (*quercus* sp.), 54,400 tons; "espino," 100 tons; ash, 200 tons; "guaje" (*lagenaria vulgaris*), 700 tons; "guasima," (*guazuma polibotrya*), 480 tons; the bark of this tree is utilized as a textile, its fiber being very strong; guava tree, 240 tons; laurel, 100 tons; "linaloe" (*burseia aloexylon*), 300 tons; this tree contains an aromatic gum; liquidambar, 1,200 tons; this is a very fine wood; "madrono," 1,500 tons; mesquit, 3,000 tons; orange-tree, 300 tons; walnut, 340 tons; "oyamel," "abete," or "pinabete" (*abies religiosa*), 6,000 tons; "ocote," 115,000 tons; "palo blanco," 200 tons; evergreen oak, 500 tons; willow, 600 tons; "tepehuaje," 300 tons; sapota-tree, 1,000 tons; pine (the different species), 90,000 tons.

Transportation.—For the hauling of timber there are the same railroad facilities which are indicated in the chapter on Agriculture; the railways, however, cannot be used for shipping the timber which exists in very large quantities in the region near the Mixteca sierra, Zacapoaxtla and in other parts of the State. The rivers which flow into the Mezcala can be utilized for floating the timber up to the point where this river is crossed by the Oaxaca Railroad, whence it can be taken by freight to the desired markets.

QUERETARO

Although Queretaro possesses large plains, such as the Llanos del Cazadero and part of the region called the Bajio, which have no forests, either because the lands, such as those of the Cazadero region, are pasturages without any vegetation other than herbaceous plants, or because the exigencies of agriculture have destroyed all such plants and trees

as would take away the indispensable sunshine from the corn and other cultivations, there are, nevertheless, places in the canyons of the sierras and in several other regions in which woods suitable for construction purposes and the making of charcoal particularly abound. Wood for charcoal is being cut every day of the year. The State utilizes about 6,000 tons of mesquit every year, 2,500 tons of "huisache," 7,000 tons of oak, 20,000 tons of ocote pine, 12,000 tons of other kinds of pine trees; also small quantities of "aguacatillo," poplar, ash, sabine (*taxodium mucronatum*), willow and other species.

Transportation.—In order to take these woods from where they are cut to where they can be used, carts drawn by animals are employed. Queretaro exports only a small quantity of timber. Great quantities, however, are turned into charcoal which goes especially to the City of Mexico.

All the rivers of the State, improved by engineering works, could be made serviceable for timber hauling during the rainy season when the streams carry plenty of water.

If large quantities of timber were cut and taken as far as the railroad lines of which there are many in the State, they could be easily exported, thus becoming a very important source of wealth.

QUINTANA ROO

With the exception of a few cultivated areas and the stretches of pasture land, the largest part of Quintana Roo is covered with natural forests, which the State Department of Agriculture has leased to a number of concessionaries for the exploitation of precious timber. Mahogany, sapota, and ebony are

the trees that predominate in these forests. Chicle or sapotilla-gum, the bark of the "chucum" (used for tanning purposes) and the mangrove-tree are cut in considerable quantities; the mangrove is also used for tanning.

Transportation.—Roads for transporting these products are few and most of them very primitive. In the neighborhood of the village of Santa Maria and Solferino several tramways drawn by mules have been constructed. Bordering the territory of British Honduras is the Rio Hondo river, navigable by small boats as far as the Chetumal bay; then there is the Rio Azul along the frontier of the Central American Republic of Guatemala, the shallow waters of which allow only the use of rafts.

SAN LUIS POTOSI

The State owns some splendid forests, mostly covered with tropical vegetation in the Huasteca section; in the center there is much mesquit, and in the mountain ranges of the central western parts there are pine and oak. The Huasteca section has impenetrable forests which have not been worked for want of suitable roads. The timber regularly cut in the State includes the following: the ahuehuate conifer, also known by the name of "sabine" tree, with an annual yield of over 600 tons; cedar, 900 tons; "copalillo," 600 tons; oak, 5,680 tons; laurel, 4,300 tons; mesquit, 81,700 tons; mulberry, 200 tons; "palo blanco," 1,700 tons; pine, 2,900 tons; "tepehuaje" or "tepeguaje," 100 tons.

As may be seen, the State is not a large producer of timber, but could easily become one, as it has large quantities of woods which only await proper

means of transportation to become a source of income to the population.

Transportation.—At the present time the best railroad lines for lumber traffic are those from San Luis to Tampico, the branch lines from San Bartolo to Rio Verde, and from San Luis Potosi to the mining camp of San Pedro. The cart roads in the central sections of the State provide an outlet for a certain quantity of timber, but in the Huasteca region it will be necessary to build railroads or roads which will allow of motor traffic, neither this nor railroad construction being very difficult, as, although the country is rather broken, it has abundant material for such construction: timber, stone, etc.

Several rivers with a large volume of water, such as the Verde, the Santa Maria, the Ramuin, Valles and Tampean, can be used for the transport of the lumber as far as Tampico, all these rivers reaching that point by joining the great river Panuco, into which they empty their waters.

SINALOA

The entire State has forests the conservation of which is chiefly due to the fact that no facilities exist for taking out and shipping the timber to the interior of the Republic. To some extent, however, these forests are exploited yielding the following quantities annually: "ahuehuete," 2,000 tons; "arrayan" (myrtus arrayan), 200 tons; "amapa" (tabebuia sp.), 2,300 tons; "aguacatillo," 125 tons; "hobo," 150 tons; Brazil wood (caesalpinia boreale), 2,100 tons; "palo de rosa" (tecoma multiflora), 100 tons; mahogany, 300 tons; cedar (ce-

dreila glaziovii), 2,300 tons; copal (*cyrtocarpia procera*), 230 tons; ebony, 300 tons; evergreen oak, 5,800 tons; oak, 2,500 tons; "guayacan" (*guaiacum sanctum*), 500 tons; "huamuchil," 200 tons; "huisache," 4,000 tons; mesquit, 5,400 tons; moral (*morus nigra*), 3,200 tons; "palo blanco" (*celtis occidentalis*), 1,000 tons; "palo mulato" (*celtis berlandieri*), 400 tons; palo colorado (*quercus virens*), 1,800 tons; "palo dulce" (*eysenhardtia*), 800 tons; "palo verde" (*parkinsonia torreyana*), 300 tons; pine (several species), 670 tons; "jabin" (*piscidia erythrina*), 400 tons; sapodilla-tree, 100 tons; "tecomaxochitl" (*cachlospermum hibiscoides*), 200 tons; "guacimilla" (*guazuma polibotrya*), 100 tons; "ebano mulato" (*calliandra formosa*), 300 tons; "cacahuananche" (*licania arborea*), 230 tons; "amapabola" or "chucte" (*miroxydon pereirae*), 80 tons. Other woods are also cut, but in smaller quantities.

There are many other species of trees in the forests of this State that are not exploited, though usable in various industries.

Transportation.—The rivers of the State offer the best facilities for the hauling of timber; they flow in the desired direction, they are numerous and provide the best routes for the shipping of the timber directly to the Pacific or to points where the rivers are crossed by the railroad.

SONORA

This State possesses great forests. Along the Sierra Madre Occidental, in its large Alamos, Magdalena, Cananea, Arizpe and other mountains and in the great valleys which are surrounded by these,

there are immense stretches of woodland furnishing splendid timber for all kinds of purposes.

The trees that at the present time are exploited and the average yearly production are as follows: alligator-pear tree, 230 tons; alder, 200 tons; "ahuehuete," 1,200 tons; poplar, 8,000 tons; "huamuchil," 8,600 tons; "guayacan," 4,600 tons; "huisache," 3,000 tons; willow, 1,500 tons; brazil-wood, 6,000 tons; evergreen oak, 130,000 tons; mesquit, 100,000 tons; "palo blanco," 2,800 tons; oak, 9,000 tons; pine (*pinus cembroides*), 3,600 tons; "taray" (*eysenhardtia orthocarpa*), 7,500 tons; ocote pine, 5,000 tons; sapota, 2,400 tons.

Transportation.—Besides the transportation facilities which are indicated in the chapter on Agriculture, there are the rivers which can be utilized for transporting timber, for all of them flow into the Gulf of Cortes, and most of them carry plenty of water all the year round.

TABASCO

Tabasco is undoubtedly the richest State in timber. The whole State is one luxuriant forest full of a multitude of plants and trees which in themselves represent vast wealth. Still, all this wealth is scarcely utilized at all. The choice woods which are in great demand abroad, leave the State in relatively small quantities. The cost of transporting them to Frontera, the shipping port, is ridiculously small; the greatest difficulty is encountered in getting the timber out of the far-away forests.

The kinds of wood which are principally exported, all of them going abroad, are the following: mahogany, some 7,000 tons a year; cedar (*cupressus*

benthaniana), 3,000 tons; red cedar (*cedrela glaziovii*), 1,000 tons; "cocohite," 980 tons; "chicozapote," 1,500 tons; "guasima," 1,400 tons; logwood, 1,200 tons; black-mulberry tree, 2,000 tons; Campeachy-wood (*hematoxylon camperchanum*), 1,600 tons; "cari," 400 tons; "palo gusano," 300 tons; bloodwood, 600 tons; "lanchan," 280 tons; "nahuatéc," 400 tons; "luyn," 230 tons; yellow laurel, 500 tons; "nahuatéc," 540 tons; and an infinite number of other woods. There are in the forests of Tabasco an astonishing variety of cabinet-maker's and carpentry woods, such as ebony "majagua" (tree of the linden family), palisander, "quiebrahacha" (a kind of ironwood), liquidambar, which are not cut to the extent which the resources of these immense forests permit.

Transportation.—The State has ample facilities for moving all the timber cut, as it possesses an almost unbelievable network of rivers, all of them with plenty of water and all of them finally making their way to the same point: the Bar of Frontera, where all the lumber is shipped to any desired point.

Tabasco is certainly a State with a brilliant future, as soon as energetic men from any part of the world realize the splendid business opportunities which will be created by the steady and scientific exploitation of its enormous resources.

TAMAULIPAS

There are many forests in this State, especially in the southern section of it, in which there is an abundance of "pochote" or "ceiba" trees (*eriodendron grandiflora*) which produce an excellent kind of cotton; ebony, alder-trees, "arrayan," "aguaca-

tillo," "algodoncillo" (*inga* sp.), "bejuco" (*hippocratea* sp.), balsam, "bari" (*cordia gerascanthoides*), "capomo," "camichin" (*ficus fasciculata*), "cepillo del diablo" (*cumbretum jacquini*), mahogany, "copalchi" (*couteria latifolia*), "chilte" (*manihot foetida*), "siricote" (*cordia dodecandra*), "cacahuananche" (*licania arborea*), "striped ebony" (*diospyros velutina*), "hobo," "jaboncillo" (*sapindus drumondi*), "limoncillo" (*dalea citriodora*), black mangrove (*conocarpus erecta*), walnut, "parota," "palo de fierro," "jabin" and other species.

The kind and quantities which are worked at present are as follows: "ahuehuete," 3,000 tons; cedar, 400 tons; oak, 9,600 tons; mesquit, 100,000 tons; mahogany, 500 tons; pine (*pinus montezumae*), 3,700 tons; ebony, 100,000 tons; "capomo" (*brassimum alicastrum*), 200 tons; "camichin," 100 tons; and smaller quantities of other woods.

As will be gathered from these statements, the State of Tamaulipas is not noted for the exploitation of its forests, though it has all the necessary facilities to do so. Its rivers, for instance, can all be made use of for the hauling of timber; all of them flow in the right direction.

Transportation.—As already stated, if Tamaulipas does not sufficiently exploit the riches of its forests, the fact is certainly not due to the lack of means of transportation. The rivers Panuco, Tamesi, Tampoa, Conchas, Soto de Marina can easily be utilized as a means of transport. These rivers carry plenty of water and are navigable for a considerable distance from the ocean. Furthermore, there are the railroad lines, which, though not very numerous, run in the right direction and carry the timber to the desired places; and then it

must not be forgotten that the splendid market of the United States is nearby.

TLAXCALA

Correctly speaking, there are no forests in Tlaxcala which could be very profitably worked. There are many wooded parts, but these are not at all like the large forests which exist in many other States of the Federation. In its mountain ranges, especially those in the region known under the name of "Malinche," there are forests of conifers, chiefly of the sacred fir (*abies religiosa*), of which about 5,000 to 6,000 tons are exported; pine (chiefly *pinus pseudostrobus*), 10,400 tons are exported; "ahuehute" or "sabino," 2,875 tons; "aile" (*alnus glabrata*), 346 tons; evergreen oak, 234,600 tons; and torch-pine, 245,000 tons; the last two are really large amounts considering the size of this Federal unit.

As is seen, the class of timber which is plentiful in the State of Tlaxcala, on account of the high elevation of its valleys and mountain ranges above sea level, is that which is suitable for construction and for fuel. The major part of the oak, all the pine, and some of the other varieties of timber are used for home consumption as fuel.

There are some forests on the slopes of the Nevada and Tlaxco mountains which come within its borders, and also in several valleys, defined by its rivers.

Transportation.—In a general way it may be said that facilities for the transport of Tlaxcala's timber are plentiful, it being sufficient proof to note the large amount shipped, especially of fuelwood. These transport lines are the railroads to Puebla, Vera-

cruz, Pachuca, the latter being the principal market for Tlaxcala. On the other hand, the rivers which rise in the mountains where the valuable timber grows, and mostly flow down to the Puebla valley, approaching the railway lines, have the advantage that, by means of small inexpensive improvements, such as canalization, they can be converted into transport routes. Cart roads are not difficult to build, as the State is not very mountainous, and its plains lend themselves to the construction of railway lines.

VERACRUZ

This State has been favored in the matter of forests as much as in that of agriculture. Its forests are numerous and contain all kinds of useful and excellent timber. They have never been exploited regularly and according to scientific standards, but they offer a brilliant future to investors. The following figures represent the quantities which at present are gained, on an average every year. Balsam, 524 tons; mahogany, 13,000 tons; nearly all of this is exported to foreign countries; cedar, 25,000 tons; cypress (*cupressus sempervirens*), 678 tons; evergreen oak, 40,000 tons; "huisache," 6,700 tons; mesquit, 2,000 tons; black-mulberry tree (*moral-morus nigra*), 21,600 tons; ocote-pine, 6,780 tons; "oyamel," 5,435 tons; pine (different species), 34,500 tons; oak, 62,000 tons; sapota tree, 15,000 tons. There are other species of trees, of which smaller quantities are cut and shipped, such as "palo amarillo" or yellow-wood, "palo de corps," "pimientillo," mulattowood ("palo mulato"), "palo lecherillo," "palo ramoncillo," "solenillo," rose-wood, "chijol," "tepemesquite," "guava-tree," "palo

gusano" (wormwood), "palo de sangre" (bloodwood), "nahuatl," and others. These woods are mostly used in the cabinet-making industry. Large quantities of ebony, also called "black sapota," are exported; this tree grows everywhere in the State, but especially in the region called the Huasteca. In the great central valleys and in the sierras by which they are crossed, are located the large forests, but trees are found all over the State, even near the seashore.

Transportation.—The many railroad lines which cross the State in different directions, are naturally of great service in carrying the timber to the seaports, to be reloaded on the many ships that touch there, but there are still a good many difficulties encountered in bringing the timber from the forests to these railways. Some of the rivers in the State are certainly a great aid in the process, such as the Nautla, the Cazonas, the Tecolutla, the Tuxpan, the Medellin, the Papaloapam, the Blanco, the San Juan, and the Coatzacoalcas, for they all flow in the desired direction. In some places the rivers had to be improved to accomplish that end.

YUCATAN

Reliable data concerning the extent of the forests in this State, and for that matter in any other State in the Mexican Federation—are not obtainable. In Yucatan they are scattered all over the State. The wood, mahogany, cedar, breakaxe, ebony, and others used for construction purposes. The timber is taken out over the existing cart roads or by rail. National timber predominating in them include Campeachy-forests can be leased from the Government for the purpose of cultivating the land, cutting timber or

firewood, collecting gums, such as rubber or "chicle" (sapodilla-gum) and bark from the "chucum" tree used for tanning, or being converted into pastures. The taxes to be paid in each case are as follows: for pastures, 30 centavos (15 cents) a year per hectare; for cultivation, one peso (50 cents) a year per hectare; for the gathering of rubber or sapodilla-gum, 100 pesos (50 dollars) per ton; for cutting firewood once, one peso per ton; for cutting chucum bark once, 8 pesos (4 dollars) per ton. In leasing forests by contract extending over a period from one to five years, for the purpose of cutting timber or gathering rubber or sapodilla-gum, a tax of 50 pesos (25 dollars) is paid for every ton shipped. All such contracts are made with the local Agency of the Department of Public Works, generally located at the Capital of the State. In leasing forests for five or ten years a sum of 50 pesos (25 dollars) is paid for every thousand hectares. Such leases are obtained from the Department of Public Works at Mexico City, through its local Agency. No leases are granted for less than 100 hectares. These statements, however, are not absolutely reliable, in as much as new laws concerning the matter, may be enacted at any time by the Government. The data concerning terms under which land may be leased do not refer only to this State, but to any section of the Mexican Republic.

ZACATECAS

Forests are found only in the southern and western sections of the State, few in the center and none in the east and north. There are large numbers of trees in the Valley of Valparaiso, and the sierras

which form this valley are covered with forests of oak, the variety of timber that abounds most in the State of Zacatecas, but there are also pine, poplar, "alamillo" (*populus tremuloides*), "palo blanco," "palo colorado," and evergreen oak, in smaller quantities. Willow and "sabine" grow along the banks of the rivers. As already stated, oak is the timber that predominates, its average yearly output reaching 500,000 tons which leave the State. This wood is highly valued by industrialists and is generally used by wheelwrights; poplar produces 700 tons; "huisache," 4,000 tons; cedar, 620 tons; mesquit, 5,000 tons; "palo blanco," 600 tons; this wood is also called "acebuche" (*forrestiera murocoides*); there is another species of "palo blanco" which in botany is the "*celtis berlandieri*"; "palo colorado," of the oak family, produces 920 tons; evergreen oak, 600 tons; willow, 200 tons. Considerable quantities of all this timber go to the machine shops of Aguascalientes, the most important of the kind in the Republic.

Transportation.—The Central Railroad serves in the main in the transporting of the timber of this State; the Canitas line brings it, together with the timber from the State of Durango, to the mines of Sombrerete, Chalchihuites, Noria de San Pantaleon and other places. Carts drawn by animals are used for the hauling of the timber from the forests to the railroad stations or other points of the lines whence it is shipped. These cart roads are far from being in good condition, but a little energy and spirit of enterprise could easily raise them to the desired standard. The rivers, though most of the time carrying sufficient water, are of no use in the hauling of timber, because they run in a direction opposite to the one that is needed.

CHAPTER IV

LIVE-STOCK RAISING

The raising of live stock has always been one of the principal sources of wealth in the Republic of Mexico. The truth is that it could scarcely have been otherwise, since all the necessary conditions for this very important industry are there. In some sections of the country the finest pastures are found, suitable for the raising of high grade cattle and horses; in other sections, such as the woodlands, numberless hogs can be raised with very little cost; in other regions, especially in the north of the Republic, sheep-raising is extremely profitable, while the raising of goats is successful in the waste lands.

Conditions in the matter of stock-raising naturally differ according to the States or sections of Mexico. This field is at the present time one of those that offer the best prospects for the investment of capital. Live-stock raising has suffered a great deal in consequence of the revolutionary activities which lasted over ten years, but all present conditions indicate that a return to the former state of prosperity in this respect is not far off.

In this chapter as well as in the others of this book all the desired information is found in regard to the different States and Territories, placed in alphabetical order.

AGUASCALIENTES

The principal "haciendas" or farms devote as much attention to cattle-raising as to agriculture. Not even those that are almost entirely given over to agricultural purposes, such as El Ojo Caliente and San Ignacio, fail to give attention to live stock. The whole of the State is greatly interested in cattle-raising, and the city of Aguascalientes is the place where one most frequently observes the "charro" (or cowboy) costumes worn by rich and poor alike, many of them being positively gaudy (which is the real meaning of the word "charro"); these cowboys are adepts in horsemanship and their greatest pleasure is to be mounted on the high-spirited horses of this region. The Palo Alto, El Pabellon, La Honda, La Punta, Saucillo and Guadalupe haciendas are large cattle estates where the raising of wild bulls is specialized in. The cattle is the product of crosses between Spanish bull stock and local breeds; the specimens are not very heavy, but are good fighters.

Cattle are also raised for the meat market and the dairying industry, being generally of purely local grades, which are not at all noted for their fitness for either slaughter or milk-giving.

In general the *pasturage* is that which grows naturally and consists of various "zacates" (kind of pasture grass), among which the so-called "zacate borregoero" is best suited for cattle feed.

Cattle-raising could certainly be largely increased, as there are in this small State enormous tracts of land which are not used for that purpose; that is to say, that Aguascalientes has room for more cattle, and also there is room for the improvement of the

present breeds by crossing them with the Batavian or other kind of imported cattle. The most suitable section for cattle is the western which is rich in pasturage and does not suffer much from droughts, it being possible in any case to make small reservoirs from which to water the cattle.

Agascalientes carries on *dairying* successfully. Its cheeses are eaten in San Luis Potosi and also in Tampico, and that to a very large extent. Its butter is highly esteemed.

Bee-keeping is engaged in in this State, and its annual product varies from 35 to 40 tons. It could be largely increased.

Poultry-keeping is also carried on to a small extent but could be increased, as there is always a market for these products in the towns of San Luis Potosi, as well as in Tampico and on the oil fields.

The live-stock farmers of this section specialize particularly in horse-raising, the products of which are local breeds, though descended from crosses with Andalusian horses.

BAJA CALIFORNIA

The raising of live stock has its difficulties in this section of Mexico, not only on account of the excessive heat, but probably more so on account of the scarcity of water. In spite of that, some live stock is being raised, especially of the minor kind, such as sheep and goats, for these thrive easier on dry lands and are satisfied with the water from cisterns. The haciendas of Quepo, Huerta Vieja, San Juan, Jesus Maria, Calamchi, Placeres, Santa Ursula, San Quintin, San Pedro, Calentura, Santa Clara, Guadalupe and a number of

others give some attention to cattle-breeding. As a rule, the grades of the cattle are not very high, for the Territory has climatic and other disadvantages which cause the stock to be of a rachitic kind.

The *pasturage* is natural, such as grass, herbs, leaves, the browse of the mesquit, the thyrus of "ocotillo," and various plants of the cactus family.

We do not believe that there is any possibility of increasing live-stock raising in Baja California before providing the regions, which have good feeding for the stock, with the necessary water from artesian wells; still less advisable would it be to import stock of the better grades, which require far better conditions than those that obtain here, in order to get any kind of results. On the other hand, a better grade of sheep and goats could be introduced, especially the kind known as merino (*ovis aries hispanica*). The kind called "dunes," a little larger than the Dishley and yielding exquisite meat, would probably give good results, and, in view of the hard soil, the breeds from the Pyrenees might thrive well here. With regard to goats, the Cashmere would probably give good results, since the Angora, also a fine species, generally degenerates or at least loses some of its best qualities outside of its habitat. As to milk-giving breeds the real Maltese goat is to be recommended; the same is to be said of the Egyptian and Nubian stocks, all of which would easily adapt themselves to the climate and the soil of Baja California.

Bee-rearing could be introduced, for there are numerous species of plants and flowers in the country that contain sugar and are not malignant.

Poultry-rearing offers no chances in the Territory,

due to its great distance from large centers and the lack of means of communication.

CAMPECHE

The raising of live stock yields the best results in the District of El Carmen. Very large areas of natural pasturage are common in this section of the State, therefore the raising of live stock can be extended here at will. Many farms or haciendas are found in this District that have four or five thousand heads of cattle. The same kind of pasturage known under the name of "sabana" is also found in other Districts of the State, but cattle-raising meets, as a rule, with great difficulties, because there are no regular roads to bring the stock to the desired markets, though in the District of El Carmen the splendid rivers serve this purpose very well. The stock found on the farms is generally of the natural variety, *i. e.*, the one derived from the stock brought into the country by the Spanish Conquerors. Lately some stock has been brought in from Texas with very good results. Naturally a careful selection would eventually produce the stock most suitable to the country. There are artificial pasturages on nearly all plantations; the grass planted is the one called "parana" in the State and "egipto" in the State of Tabasco. These artificial pastures constitute a very useful factor in the raising of live stock.

Sound commercial reasons should lead to a more extensive exploitation of the by-products of live-stock raising, especially with regard to hogs. Large quantities of lard have to be imported from the neighboring State of Tabasco, while all the butter

and cheese consumed comes from the United States.

As to the raising of bees and poultry not much attention is paid to these industries. Honey is obtained from a small wild bee which produces little but requires no attention whatsoever. The honey this wild bee produces is very delicious, especially the kind called here "extabantun," this being the name of a vine which grows abundantly in all sections of the State. As for the poultry, no rational method is observed in rearing it; fowls are left in the open without any care, and, of course, the results are such as must be expected. Nevertheless it must be stated that the poultry raised in such primitive ways satisfies the local market.

CHIAPAS

Chiapas is unquestionably rich in live-stock raising, and could be much more so, as the ranchers can readily dispose of all the products of the industry. The class of stock, which on account of climate, the nature of the soil, and the tastes of the people, is most suitable, is cattle. There are large numbers of cattle living in the plains, valleys, and in the forests. Up to the present time, the people of this State have troubled themselves very little about improving their herds, because they have the conviction that their cattle gives good returns, and it is a fact that the cheeses produced here are the best on the market, even superior to the famous "La Barca," of the State of Jalisco, due to the richness of the pastures of the Chiapas meadows.

The pastures are generally of spontaneous growth, artificial or cultivated grasses not being needed; the farmers also feed the cattle with

"tlazoles" (corn tops), stubble, barley straw, alfalfa, etc.

Undoubtedly Chiapas is the State best adapted for an active development of the live-stock industry, cattle offering the most advantageous prospects, although, of course, much could be accomplished with other live stock, such as sheep, which would furnish wool, skins and other by-products. The entire Chiapas region is suitable for stock-raising. It would therefore be easy and highly profitable to give better attention to cattle by-products, such as fats, butter, and cheese, of which, as has been mentioned, an excellent quality is produced, all of which would have a sure market, as they could favorably compete with the products of other parts of the country and abroad. The annual milk-production exceeds two and a quarter million liters. (A liter is somewhat more than a quart.)

Bee-keeping should be developed, as there are an infinity of flowers which produce the nectar necessary to supply the hives with, and there is a good market for the honey.

Poultry-keeping, although offering a good field, would not be as profitable as the industries previously mentioned.

The haciendas of Chiapas, almost without exception, devote themselves to the raising of cattle. Among these the following may be mentioned: Santa Rita, Los Toros, Hular del Suchiate, Santo Domingo, Samajoa, Grandeza, San Isidro, La Nueva, Montenegro, Laguneta, Santa Maria, Santa Ana, Juncana, Triunfo, Nueva Esperanza, Chacalaltic, San Joaquin, San Jose, Baja, Jotana, Palma Real, San Juan, Champa, Oajaca, Egipto, Lacanjah, Cayo, Venado, Resbalon, El Camino, El Real, San Miguel, Con-

cepcion, Chinchilla, Santa Lucia, Paredon, Horizonte, Santiago, Alamos, Jiquipila and many others.

CHIHUAHUA

Stock-raising is the principal source of wealth in this State. Its vast prairies feed millions of animals: cattle, horses, sheep, goats, donkeys, mules and hogs. If we had to give a list of all the cattle-ranches we would have to give the names of all the farms existing all over the State; therefore we mention only a few of them: El Espejo, La Mestenas, La Enramada, El Barrial, Encinillas, Punta del Agua, Alamos, Las Arenosas, El Rio del Parral, Victoria, El Alamito, Corralitos, El Carcay, El Gavilan, Ramos, El Espindilena, Labor de los Terrazas, Dolores, Santo Torribio, Carretas, El Tecuan, Los Llanos, La Purisima, Bustillos, La Laguna, San Jose de Babicora, Las Delicias.

The cattle herds number more than a million head, most of them domestic breeds, but with an increasing proportion of cross-breeds of the native type with American grades, especially Jersey and Durham. Chihuahua obtains about forty-eight million liters of milk per annum, making some 2,000 tons of cheese and 600 tons of butter. The herds of horses number about 300,000 heads, mostly a cross-breed of large animals. Chihuahua has for years provided horses for the Mexican Cavalry.

There are also very considerable numbers of sheep, goats, hogs, mules and donkeys. Live-stock raising in all its varieties is the principal occupation and source of income of the people of Chihuahua.

The pastures are exclusively of the natural type, comprising excellent growths, such as the "zacate

borreguero" (*bouteloua oligostachya*), camalote (*panicum crus-galli*), "cola de zorra" (*muhlenbergia affinis*), "grama" (*paspalum distichum*); "te blanco" (*bides leucantha*). Corn tops, stubble, straw, etc., are also utilized for feeding; also the leaves of some trees and shrubs, the tender browse of the mesquit, the nopal, the "candelilla" and some other plants.

Although the number of cattle in the State seems to be very large it could be a great deal larger still; this should be the case with cattle and especially horses. Furthermore, the ranch-owners should pay more attention to the exploitation of the by-products of the stock-raising industry, of which at present not one-tenth is turned to account. Thousands of cows are roaming about the immense plains, without their milk being utilized in any form.

Bee-rearing is very little attended to and is not producing enough of honey and wax needed for local consumption. Most of the wild flowers, especially the so-called "estrellitas," white lilies of the field (*milla biflora*) and many others could very well support thousands of hives, without requiring the least attention.

Poultry-rearing such as it exists at present in the State of Chihuahua does not amount to anything. Poultry farms in the neighborhood of the railroad stations would be a highly paying business.

COAHUILA

As a raiser of live stock this State is not so important as other States of the Republic which are less extensive. This is chiefly due to the lack of streams in the vast areas of its territory, making the

existence of herds impossible. There are, nevertheless, a number of stock farms, the animals of which are of a far better grade than those in other regions, due to the fact that the farmers have been able to learn from the example of the United States. The most important stock farms are the following: Aura, Pajaros Azules (both in the Rio Grande district), La Babia, El Espinazo, Anheló, Guadalupe (the first two in the district of Monclava and the other in General Cepeda), Colón, El Águila, El Marques, La Cruz (all in Monclava), and others which raise cattle, horses, sheep, goats and hogs, all of which are cross-breeds.

The pastures are generally of the natural type, there being an abundance of "zacate borreguero," the kind of pasture most frequently met with, "candelilla," browse of the mesquit and other plants. Cattle and horses feed also on the nopal and the "biznaga" (carrot-like ammi), when they are very thirsty, and it is not a rare thing to see the animals open this plant with their hoofs, in order to quench their thirst with the moisture of the plant. Barley of which 5,400 tons are harvested every year, is also fed to the animals as is the stubble of corn; wheat and the other cereals are utilized for the same purpose.

The raising of live stock can be greatly increased, provided the watering problem be solved in the proper manner.

The kind of stock that promises the best results in this State under the present conditions,—very unfavorable as far as water is concerned—is the sheep to some extent, but chiefly the goat. Better grades of this class of stock than the ones existing now should be introduced. In those regions where con-

ditions are more favorable, as in the district of Saltillo, Monclava, Sabinas and others that have sufficient water, the stock is of a better grade, both as meat and milk producers. As we have already stated, the farmers as well as the stock-raisers profit by the example offered by the neighboring United States and make good use of it.

There is in this State a tendency to exploit fully both the stock itself and its by-products. On an average 80 tons of cheese are produced every year, 58 tons of butter, and about nine million liters of milk.

The rearing of bees would flourish only in the well-irrigated regions, where there is an abundance of flowers.

Poultry-rearing is very much neglected in the State, but all the necessary elements are there to make it a financial success, since the people of the State itself, now compelled to buy this kind of product from outside markets, would be the best consumer.

COLIMA

Cattle-raising is one of the sources of wealth in this State; it is well attended to, though this does not mean to say that the stock farmers have made any serious effort towards bettering the grade of cattle, which is of native breed, a poor milk-producer and of little value to the meat market.

The principal estates or haciendas give preference to the raising of cattle. The most important stock farms in the State are: Estancia, La Capacha, Chical, Pisila, Alpuyeque, Los Limones, Buena Vista, San Joaquin, Cualata, Periquillo, Nogueras, Santiago, Canada, San Antonio, La Parranda,

Guerrero, La Magdalena, Xala, El Rincon del Barrio, El Cacao.

A better kind of stock, as for instance the Durham, should be introduced in the State; and with such a stock, which is a splendid meat producer, the State could take advantage of its favorable location in exporting live stock or meat. Furthermore, since the people of Colima are interested in the milk industry, they should get the Jersey stock which yields plenty of milk and cream; the rich pasturages of the State make all this practicable.

The pastures are of the spontaneous type: very nutritious herbs for the diverse classes of stock are extremely abundant. On the other hand, the watering places are plentiful, consequently there is no reason why the stock-raising industry should be any longer neglected. There are also plenty of fruits, like the guava and the "capomo" leaves which not only help greatly in fattening the stock, but increase enormously the milk-producing quality of cows.

Consequently the raising of cattle should be increased in this State, by crossing the native breeds with imported grades, either from the United States or Holland. The grades of the horses should also be bettered in the same way; the region is very appropriate for this class of live stock. Strictly speaking there are no different regions in the State of Colima: the entire State has identical conditions; therefore, the raising of live stock offers everywhere the same splendid chances.

At present, in spite of the poor grades of cattle that are raised in this State, somewhat more than a million liters of milk is obtained on an average every year; furthermore, about 100,000 tons of

cheese and some 80 tons of butter are prepared for the market. These figures clearly demonstrate the strong inclination of the people of this State for the exploitation of cattle-raising and its by-products. Therefore, it would be an easy matter to extend every industry based on the raising of live stock. The tanning industry could also be developed to a far greater extent than is the case now, for there is in the State, besides the principal article, that is the hides, any amount of plants and barks of trees that produce tannin, such as the "cascalote" and others.

It is to be deplored that in this country, due to a lack of proper knowledge in the matter of tanning, many thousands of hides are lost every year, not only sheepskins, but also hides of cattle and horses. Some quantities of raw sheepskins are utilized in the manufacturing of very simple articles for the use of the lower classes of people, but far larger quantities are entirely neglected and abandoned. A large tannery established along modern lines should convert all this splendid raw material into ready cash.

The bee-rearing industry must gradually develop in the State, first because the forests contain all that is necessary to nourish thousands of hives, and secondly, because Colima has all the facilities for exporting the products of such an industry to the United States and Canada, which apparently are the best markets.

Poultry-rearing is looked upon in this State, as in most others of the Republic, with the greatest indifference; the people are still far from realizing that this industry, attended to and exploited as it should be, constitutes a very important factor in the economic life of the State.

DISTRITO FEDERAL

No stock-farming in the real sense of the word is carried on in the Federal District. As a rule, the large ranches and the haciendas which in no instance have the proportions noted in those of the State, keep cattle, especially cows, not so much for the purpose of raising them, as for the use of the milk. For this very reason the cattle raised in the District is of the finest grade in existence, generally Dutch, Swiss and American.

This kind of stock needs, of course, the most careful attention, alfalfa being the principal feed in use. There are good pastures in the District, but not much use is made of them, except in the case of the cows which are occasionally taken to pasture to feed a little in the open.

Of course, there is an ample field in the Federal District for the establishment of more industries based on dairying and its branches, for the consumption of cheese and butter is very large, the latter products being at present imported from Toluca and certain places of the State of Hidalgo.

The same applies to the products of the bee-rearing and the poultry-rearing industries. Very little attention is given to them, though, as is quite natural, the City of Mexico and all the other important places in the Federal District, are the best markets that can be desired for all that could be produced in the two fields.

DURANGO

There are good stock-raising farms in this State, such as: Guatinape, El Registro, Alamo, Juan Perez, Saucillo, El Ojo, Santa Lucia, Catalina, Cacaria, La

Mimbrera, La Punta, Juana Guerra, Bolsa de Fierro, La Rueda, Ancon, El Mortero, La Zarca, Sombrerito, Chorro, Labor de Guadalupe, Navacoyan, San Esteban, La Parada, Chinacates, Corralejo, Lajas, La Joya, Jicorica, Ramos, Atotzilco, La Estanzuela, Cruces, Canutillo, Masamitote. The cattle is practically all of the native breed, although high grade live stock thrives well also.

Natural pasturage is plentiful, among the most common being "zacate borreguero" (*bouteloua oligastachys*), "candelilla" (*euphorbia antisiphilitica*) which grows in the calciferous soil of the eastern and northern part of the State. The cultivated pastures are: barley and alfalfa. Among the plants for cattle-feeding which grow spontaneously may also be mentioned the "aceitilla" (*bidens leucantha*), the "engorda cabras" (*dales tuberculosa*) and the tender shoots of the mesquit tree.

Cattle-raising should be carried on to a larger extent throughout the State, especially in the Sierra Madre section, which is rich in grazing grounds and is well watered. In other parts of the State reservoirs should be constructed, to facilitate the watering of the cattle. The Cuencame steppes could be utilized for cattle, sheep and goats; the strips of land of La Zarca and other plains of the Inde section are suitable for the raising of horses, mules and donkeys.

The dairying industry would then have a wider field, as there are already good roads for the distribution of its products, which are of a great value from an economic standpoint.

The poultry farms in the La Joya and San Antonio sections, near the city of Durango, used to give good results, and the same could be obtained in other sections of the State.

Bee-raising would give excellent results, as flowers are plentiful throughout the country. Torreon, Sombrerete, and other towns, both within and outside of the State, are good markets for the products of the industry.

GUANAJUATO

This State has always given much attention to the live-stock raising industry; the best proof of it is the fact that it produces annually some 7,500,000 liters of milk, 200 tons of cheese and more than 150 tons of butter, and utilizes a large number of hides of its stock farms of San Isidro, San Andres, La Mina, San Jose de Porto, San Cristobal, San Diego Incha-macuaro, Obrajuelo, San Nicolas, San Miguel, Jaral, Teresa, Agua Caliente, Providencia, Parcialidad, Teneria del Santuario, Santa Maria, Elguero, and a great many others.

The farmers in the State of Guanajuato raise chiefly cattle, but this does not mean to say that the smaller stock, such as sheep and goats, are not well attended to, for there are more than half a million heads of each of these kinds of stock, and about 200,000 heads of cattle.

The grades of these cattle are the same which have existed there ever since the epoch of the Spanish Conquest. Much better grades could be introduced, for the pasture and water conditions are most favorable. The crossing with better kinds of stock would yield most excellent results, especially with regard to the by-products of the milk-producing industry, and the figures we have given above could be easily triplicated.

Natural pastures are plentiful all over the State;

for the animals that are kept in stables and barns cultivated pasturage, such as alfalfa and barley, is used; wheat straw mixed with corn and bran is also used for feeding the stock. The stubble is used for pasturage during the months of November and December, especially for the fattening of oxen destined for the meat market. The latter usually fatten quickly, for besides the stubble, they find plenty of corn left in the fields by the harvesters.

The herds of horses feed also on the natural pastures, such as "zacate," the tender sprouts of the mesquit trees and a number of excellent herbs. The horses that are kept in stables are fed on the tops and leaves of the corn plant, barley and wheat straw, mixed, as already stated, with corn and bran.

General conditions are splendid for the further development of the live-stock industry in the State of Guanajuato: this is especially true as regards sheep for the production of wool and skins; goats for the obtaining of milk and skins; and cows for dairying, the utilization of the milk products having grown appreciable in the manufacturing of sweetmeats, particularly in the making of the popular "cajetas de Celaya" (boxes of jelly of Celaya), which are sold everywhere in the Republic.

Stock farmers in this State should try to replace the present low grades of stock with breeds, crossing the existing species with good American grades, for instance. There are regions in Mexico where probably no grades other than the small native ones would thrive, but such is not the case in the State of Guanajuato. The whole region is one solid fine pasturage.

Bee-rearing has its practitioners in the State, but not to the extent, which the existing favorable con-

ditions would warrant. It would be an easy matter to increase this industry which will always bring in good returns, since there are many good markets for its products.

There is quite some poultry-rearing in the State, but it is not attended to in a modern way and on a scientific basis; therefore, the results are not what they should be, in view of the excellent market for poultry produce.

GUERRERO

The State of Guerrero possesses excellent facilities for the raising of live stock, although it is handicapped by the lack of proper means of transportation. Its cattle herds are numerous, as can be inferred from the fact that its milk production reaches some 4,200,000 liters a year, not counting that which is turned into cheese, of which about 700 tons are exported to other places of the country, and the quantities that are used in the manufacturing of butter, of which somewhat more than 150 tons are obtained. This data would make one believe that the stock farmers have taken special care in selecting their stock, but such is not the case, as the cattle raised belongs to the small rachitic native breed. Horses, mules, donkeys, sheep, goats and hogs are also raised in large numbers, though five times more could be raised without any special effort.

The conditions of the roads have caused the farmers to devote special attention to the raising of mules, of which fine, strong large-sized animals are produced, for the saddle as well as for carrying pack loads.

There are highly favorable conditions in the State for the extension of cattle-raising, and

consequently for the greater production of its by-products.

Some farmers in the State devote particular attention to the rearing of bees, although the exploitation is not conducted as yet on a large scale; at present some 300 tons of honey and about 90 tons of wax leave the State every year.

Poultry-raising on a large scale would do well from a commercial standpoint. Of course, such kind of enterprises must be located in places that offer the necessary facilities for the exporting of the produce.

HIDALGO

The land in Hidalgo possesses plenty of good pasture, and although cattle-raising is somewhat neglected at present, it forms a considerable part of the activities of the inhabitants. There are many haciendas which devote themselves in part to the raising of live stock, chiefly cattle, while at the same time engaging in agriculture in general and in the cultivation of the maguey plant, which is in great demand and thrives in the plains in particular. Not a few of these farms have cattle of good grade, mostly of the best breeds, which they use for dairy-ing purposes. Horse-raising is largely engaged in, as the people here, like those of the rest of the Republic, are very fond of horses. It is to be regretted that, as is the case in the State of Mexico, the stud horses are not improved grades of greater height and a less scrubby appearance, for instance, than those in the State of Zacatecas, which have to fight against unfavorable conditions, especially as regards water supply. The pasturages of this section, located in the torrid zone, support a

large type of horse, which, from all points of view, is more profitable. The chief haciendas which devote themselves to stock-raising in addition to agriculture are: San Antonio, Jala, Tepa, which is one of the best "pulque" brewing haciendas, San Miguel, Nextlalpan, Metepec, Montecillo, and a number of others.

As a rule, the pasturage of those farms which are not distant from the stations of the railroads and can engage in the milk business are of cultivated variety, consisting of alfalfa and even the maguey plant, which imparts a peculiar and not very agreeable flavor to the milk. In other parts the pastures are natural-grown, the "zacate," "aceitilla" and various fodder plants being abundant.

Hidalgo is one of the States that might further develop its live-stock raising industry and raise it to the level of that in the State of Mexico, which has greatly outstripped it in this respect. There are here inducements for engaging in this important branch of industry as exist in that State, under conditions which could not be more favorable. Various lines of railroads connect Hidalgo with the Capital of the Republic, and the establishment of others will give it exceptional importance, especially when the projected line from Beristain (Puebla) to Tampico unites it to that port. For the present we may mention the sections of Apam, Tula, Tulancillo, Teocalco, Concepcion, Tellez as being good places to establish cattle ranches with the certainty of success. All these points are connected with the Capital of the Republic. The allied industries of butter-making, pig-raising, fresh and matured cheese production, etc., might be engaged in, which would be a paying proposition and would com-

plete the exploitation of the entire field of cattle-raising.

The cattle which should be introduced is the same as are found at present at Tlalnepantla, Cuautitlan, Lecheria and Huehuetoca, in the State of Mexico, namely the Dutch breed which gives a large quantity of milk. In places located at a distance from the railroad lines, Durham cattle would give good results, as it is fairly heavy. As regards horses every effort should be made to improve the stock now existing by means of cross-breeds with horses of English breed, but on the other hand, the latter are not suited to the Mexican pastures and would probably involve an unproductive expenditure of money on the part of the landowners, who have made no attempt to improve their horses, either for riding or sport. The Andalusian type also thrives well, and most pleases the Mexican horseman.

The State of Hidalgo could engage in the industries connected with milk production to the same extent as is done in the State of Mexico; its products have a good market for all that could not be consumed locally or in other parts of the country.

Bee-keeping is very much neglected. It should be increased or, rather, established. There is an abundance of flowers in its forests; the climate is mild, especially in the Tula and Tulancingo sections and in other localities, in which thousands of beehives can be kept. Honey is a product which is in great demand in the United States, and whatever quantity were produced would find a ready market.

In the same way, poultry-keeping should be engaged in on a larger scale: first, because the indigenous plants of this State are as excellent for poultry-feeding as are those of the State of Mexico,

and, secondly, because the products of this industry would find a market, and it would cost very little to ship them to the metropolis.

JALISCO

The State of Jalisco is also among the States that lead in live-stock raising. With the exception of the State of Chihuahua it has the largest number of cattle; it obtains about 30,000,000 liters of milk a year, some 300 tons of butter and more than 4,000 tons of cheese, the most popular kind of which is that produced in La Barca, justly deserving of fame. All the haciendas in the State pay special attention, more so than in other parts of the Republic, to the cattle-raising industry, and it is a pity that sufficient interest has not been shown in the matter of bettering the grade of cattle by crossing the existing breeds with a superior foreign kind. The pastures of the State support cattle of a larger size, and general conditions in the State are such as to make possible the raising of a more desirable type of live stock. The following are some of the most important stock farms in the State: El Plan, Bella Vista, El Pabellon, La Herradura, Chacaltepec, Ahuacapan, Cedros, Citala, Santiago, La Higuera, El Refugio, Huacasco, Hepazote, Santa Teresa, etc. There are about fifty more stock farms of equal importance with those just named.

The pastures are generally of the spontaneous kind, usually composed of "zacate borreguero," "zacate camalote," "zacate cola de zorra" (*muhlenbergia affinis*), "zacate de agua" (*andropogon macrooura*), "zacate liendrilla" (*muhlenbergia implicata*), "zacate grama" (*paspalum disticum*), etc.

The abundance of fine pastures, the existence of good watering places which could be largely increased by the construction of "jagueyes," *i. e.*, large pools or basins, in many of the streams that water the State, the favorable climate,—all these circumstances combine to encourage the increase of cattle-raising in this State. Stock-raising is already now one of the principal activities of the people of Jalisco. But, as already stated, the existing grades, cattle as well as horses, must be improved upon, especially with regard to size. Sheep and goat-raising has been pretty much neglected, and there is absolutely no reason why this should be so. The State should produce all the wool used as raw material by the factories established there, and mutton and goat meat from its own stock should help to feed the people; furthermore, the milk of the goat would be an important element in the cheese-making industry.

Sheep and goats should be raised preferably in the northern and central sections of the State, while the southern and western sections are rather favorable for larger cattle.

As to the raising of bees a number of persons are already engaged in this industry, and not less than a thousand tons of honey and 200 tons of wax is produced in the State on the average every year. The products are as a rule exported to foreign countries. The extension of the bee-raising industry would pay well in Jalisco; all conditions that insure success are there. Not only beeswax, but also the kind called Campeche-wax is produced in Jalisco to the extent of not less than 100 tons a year.

The raising of poultry is also engaged in, and a few poultry farms have already attained some impor-

tance. Further development of this industry has been held up by the difficulty of transporting animals by railway in the course of which many of them perish.

MEXICO

The very reasons that make the State of Mexico an agricultural center have compelled it to devote itself to cattle-raising; the State has won first place for having the largest number of the finest and the best milk-producing cattle in the country. Amongst the larger stock farms we mention the following few: Dona Rosa, San Nicolas Peralta, noted for its splendid fighting bulls; furthermore, the "Y," on the banks of the Lerma river, San Mateo Cuaumantla, San Javier, Lecheria, Santa Monica and others which have fine stable cows and supply the City of Mexico with milk, cheese and butter. The large farms in the neighborhood of Toluca, as, for instance, Montecristo and others, those in the valley of Bravo, the district of Temascaltepec, Tenango, Ixtlahuaca, etc., breed mostly cattle of a high grade.

The cattle in this State feed generally on pasture grass, that is at least in the southern valley. In the Toluca valley, on the other hand, there are no pastures, and the cattle live more or less on dry feed, such as alfalfa and barley, which grows here plentifully. Lerma and other sections feed their stock preferably on pasture, while Cuautitlan and Tlalnepantla use dry feed, especially in the case of cattle. Horses, sheep and goats enjoy also the pasture feed, which is known to be excellent, consisting of sage grass and herbs of different kinds. In the southern section of the State the pigs feed on the fruit that falls from the trees. In some localities the hogs are raised together with the cattle that

are fattened for the meat market; in this case the principal food is corn. Excellent lard, bacon and pork are shipped from Toluca to the market of Mexico City.

New grades of cattle could easily be introduced in the State of Mexico, as, for instance, the Durham. As for horses, a better grade than the one bred now should be developed.

It is claimed that the tapir (of which there are three different types in Mexico: the "tapir," the "danta" and the "anteburro") could be brought up as a domestic animal, yielding excellent meat and a valuable hide. The valleys near the river Balsas would be suitable for this purpose.

The great demand for live stock of all sorts in the City of Mexico should be a sufficient incentive for the further development of the stock-raising industry in the State.

Bee-rearing is fairly well attended to in this State, but it should be greatly increased. It brings in at present some 340 tons of honey, while the yield could and should be at least ten times as much. The forests have sufficient flowers to support any number of bee-hives, the product of which has an assured market in the City of Mexico.

Poultry-raising is also well taken care of. One poultry farm located at Xinantecatl is doing a splendid business. There is plenty of room for similar undertakings which would be benefited by the proximity of the City of Mexico.

MICHOACAN

Owing to the richness of its pasturage and the fact that it is well watered by large rivers, perma-

nent streams, a number of lakes and lagoons, the State offers excellent opportunities for stock-raising. Michoacan is not a cattle country at the present time, owing to the almost complete extinction of its live stock, during the revolutions of the late years; but it had been an important cattle-raising country in the past and can become such again. The haciendas of Querendaro, Atapaneo, La Huerta, La Orilla and many others give special attention to live stock. Good breeds can be acclimatized here, as the necessary feed is not lacking. Cattle is the kind of stock that thrives best in Michoacan, but there is also a fair number of horses, sheep, donkeys and pigs, generally local breeds of good strains.

The pasture on which they feed is natural grass, the quality of which is good, consisting of "zacates," "aceitilla," and a number of grasses suitable for cattle food. The fruit which is not utilized in the export trade or local consumption is fed to the live stock, the guava-fruit being very much liked by the cattle and goats, while every variety of fruit is eaten by the hogs.

This state is, therefore, an unlimited field for the development of the live-stock industry, and we may add that in the south, hogs would thrive best. New species of stock should be introduced and would give good results. In this connection we may mention the tapir or "danta," an animal abundant in the State of Chiapas, which is docile and easy to look after, and which no one has attempted to introduce into the State of Michoacan, where it should yield excellent results both on account of its hide and its fat, of which, as is well known, the tapir carries a good quantity. The tapir should be raised, preferably, on the south plateau, on the banks of the large

rivers, such as the Balsas, the Tepocaltepec, Ochuayana, Marques and others.

The dairying industry should be largely increased in Michoacan, because of the excellence of the pasturage the dairy products would enjoy a good market.

Bee-keeping and poultry-raising should similarly be looked after, as every necessary element exists in the State to make a brilliant success of these industries.

MORELOS

Much attention is given by the inhabitants of this State to the live-stock raising industry, especially so in the districts of Yuatepec and Cuautla. There is a fair quantity of cattle in the haciendas of El Puente, Altacamulco, Tenango, Santa Clara, La Abeja. In fact, live stock can be raised in all the haciendas, for good pastures are abundant and grow plentifully in all sections of the State. The various species of "zacate," the "aceitilla," and various other plants, also the "capomo," the leaves and fruit of which are a splendid feed for cows, having the peculiar quality of increasing greatly the production of milk, are abundant in this section of the country. Good markets are not far distant and would absorb the entire output, cattle as well as the by-products from the different stocks.

For these reasons the growing development of the live-stock industry, of cattle as well as of horses, sheep and hogs, cannot be too strongly recommended. The climate is especially favorable for the raising of cattle, of both native and imported stock. There are also sections in Morelos which are especially suitable for the raising of horses, for,

while the soil is hard and firm, good pasturages and watering places are not lacking. Grades of a larger size than those prevailing now should be introduced.

More by-products of the milk should be obtained in Morelos. The pastures are of the kind that produce plenty of cream, and all that can be produced in this line would have a good market in places that are not very distant. In fact, from those sections of the State that are near the Federal District, milk could be taken to the City of Mexico every day; the reason why this is not done at present, is that the quantity of milk produced is not sufficient to make the trouble and the expenses worth while.

Bee-rearing should be attended to, for there is an abundance of flowers in all sections of the State. There is already one large bee farm in Tlaltizapan. Still there is ample field for the extension and the intensification of this industry.

There are also good reasons for the establishment in the State of regular poultry-raising concerns on a modern basis, for there is always a profitable market for all that can be produced in this line.

NAYARIT

Nayarit is fairly rich in live stock, but it could be much more so. Its large plains in the high plateaus, the deep passes and the valleys along the coast can feed large herds of cattle. During the rainy season, when the climate in the sierras is temperate but very hot in the region along the coast, large herds of cattle can be seen pasturing in the sierras; these herds come down to the valleys during the winter months when the cold in the sierras becomes insufferable.

Cattle occupies the principal place in live-stock raising; this, however, does not mean to say that the raising of horses or that of mules and donkeys is neglected. The traveler who has seldom seen a donkey except in captivity, is surprised to see in the high plateaus of the sierras of Nayarit large herds of donkeys, which, as a rule, are not caught and put to work before they are six years old. The people of Nayarit devote themselves considerably to the raising of mules, on account of their use on the very difficult roads in the sierras. Donkeys as well as mules are extremely useful in the State.

Most of the estates or haciendas in this State give special attention to the raising of live stock; some of these haciendas are the following: Las Varas, Zacualpan, San Antonio, Carrizal, El Borbollon, Los Aguacates, El Colomo, Ixtapa, La Penita, Arroyo Puerco, Valle de Banderas, Maravillas, Puerta de la Lima, Navarrete, La Palma, La Libertad, La Pressa, Guadalupe, Ibarra, San Lorenzo, and a number of others.

The cattle that is raised belongs to the native grade, but stock of a better kind has already been introduced to some extent; this should be done, though, in a larger proportion, in view of the excellent pastures, the watering conditions and the favorable climate which, in a general sense, shows neither high nor very low temperatures. The horses are good, but of too small a size; some good cross-breeds should be developed. The mules and donkeys that are raised, are fairly large animals.

The prevailing pastures are of the natural kind, that is to say, the spontaneously growing species, including several kinds of "zacates" (grass), sev-

eral species of fodder plants, the leaves of different trees and the fruit that falls off the trees. Corn stubble is fed to the cows, horses, mules and donkeys that are giving service of one kind or the other.

The raising of live stock could be greatly increased in the State of Nayarit, for there are excellent conditions for all kinds of stock. Sheep and goats, that is good grades, should be introduced, as there is little of it at present. More attention should also be paid to the raising of hogs. It is quite probable that the introduction of the tapir (*tapirus berdi*) in the valleys near the ocean would be profitable.

Large quantities of milk, cheese and butter are produced at present, although not as abundantly as in other States. Certain conditions of importance in this matter are identical in both Nayarit and the State of Sinaloa which produces large quantities of cheese and butter for the American market; this line of activity will certainly attain the importance it has assumed in Sinaloa, as soon as the stock farmers of Nayarit realize its value.

The poultry-raising industry finds favorable conditions in this State; it is scarcely attended to at present, because of the difficulty of transportation.

Almost the same conditions prevail with regard to the bee-raising industry. The entire State is full of flowers and plants containing sweet substances; consequently this industry should be developed to a large extent, particularly so because it involves only very little money and little attention on the part of the farmers. On the other hand, there is always a ready market for the products, especially in the United States.

NUEVO LEON

The farmers of this State give full attention to live-stock raising in spite of the unfavorable conditions, especially with regard to water, prevailing nearly in all sections of the State. Consequently it is quite natural that in this section of the Republic mostly such kind of stock should have been introduced and cared for as is not very exacting in the matter of food and water. Goats are here the chief product of stock-raising, but cattle also is found in the southern section of the State and in the proximity of the rivers San Juan, Sabinas, Santa Catarina and others.

The raising of horses is also engaged in wherever conditions permit, but these as well as cattle are far less numerous than in the other States of the Republic. All the haciendas of the State raise stock, not only because needed in agricultural and other pursuits, but also because it constitutes an important article of food for the general public. Some of the haciendas that engage in live-stock raising are the following: San Felipe, La Fragua, El Castillo, Concepcion, La Lagunita, Boquillas, El Puerto del Aire, Cruz de Elorzas, El Refugio de Cedillos, Pablillo, San Antonio, Cienega del Toro, Dolores, La Presa, La Candelaria, Horcones, El Carmen, and a small number of others.

The pasture is of the kind that grows spontaneously and comprises different kinds of "zacate" (grass), herbs, sprouts of the mesquit tree, nopal, "viznaga" (*echinocactus electracanthus*), "viznaga de chilillos" (*mamillaria heyderii*), "viznaga dulce" (*echinocactus pilosus*), and other species of the same plant, the leaves of the "grangeno" (*celtis*

pallida), the thyrsus of the "ocotillo" (*fouquiera splendens*), the "candelilla" (*euphorbia antisiphilitica*), the "gobernadora" (*larrea mexicana*), and some other shrubs or plants on which the goats feed when there is nothing else.

As it is pasture that makes the stock, that found in the State of Nuevo Leon is generally small and rachitic.

The raising of live stock could probably be improved and increased by watering some sections of land for the purpose of growing proper pasturage, and by constructing what is called in the country "jagueyes" (large pools or basins) as regular watering-places for the stock.

In the sections suitable for cattle-raising the natural pastures should be improved upon by planting alfalfa and other fodder plants.

The rearing of bees could be engaged in in the southern sections of the State and on the banks of the rivers San Juan and Sabinas.

The poultry-raising industry is in a state of neglect and could be easily enlarged with but little money.

OAXACA

Here the lack of means of transportation is also detrimental to the live-stock industry. Because of the former the fine herds of cattle cannot be exported. In order to get an idea of the wealth in stock of this State, it will be sufficient to state that it produces more than 400 tons of cheese and 2,000,000 liters of milk, which could easily be multiplied tenfold if more attention were paid to the industry. Almost all the haciendas are engaged in live-stock raising as well as in agriculture. Among those

specializing also in live stock we shall mention the following: La Cienega, La Estancia, Cataro, Aleman, Santa Teresa, La Era, La Luz, La Chindo, Candiani, San Joaquin, El Vergel, El Rosario, Alferez, Crespo, and a great many others just as important as those named.

Cattle is the stock that is most abundant, although there are also numerous horses, sheep and goats. The former are native bred; they could be greatly improved by crossing with various foreign breeds, which would enable the raising of large-sized cattle, giving more and richer milk and carrying more flesh.

Up to the present there has been no need for cultivated pasture feed for cattle, except for those in the urban centers which have to be stall-fed. The pasturage consists of various kinds of "zacate" and other sorts of natural feed.

New kinds of live stock might be introduced in the State of Oaxaca, such as the tapir, which would find conditions well suited for its development here. More attention should be paid to hog-raising, as the land is very well adapted to this kind of live stock.

The inhabitants of Oaxaca have, of their own initiative, begun to develop milk product industries; they are making very good cheeses, which could with small effort be manufactured on a much larger scale: butter, for which there is a good and nearby market, and lard, could be used to better advantage. The hides could be tanned in the State itself, as "cascalote" and tanning barks abound in the forests.

Bee-keeping could be engaged in, and with every probability of success, as the product could readily be shipped to the United States and Vancouver,

Canada, where is a large demand for bee-products.

Poultry-raising is also being attended to, but it is strictly confined to the supply of domestic needs. No attention has been given to the raising of poultry for the supply of its products to other markets, or the shipping of poultry for table use.

PUEBLA

The State of Puebla offers splendid opportunities for the development of the stock-raising industry on a scale assuring magnificent returns. The most important live-stock raising farms are located near the flat sections of the State. A few of the principal haciendas are the following: Santa Ana, Tianguis-tengo, La Trinidad, La Axuchilera, Tres Cruces, etc. These haciendas, although devoting most of their attention to the growing of sugar-cane, engage to a considerable extent in the raising of live stock; they are located in the proximity of Acatlan. Many other similar haciendas are located in the district of Necaxa and in other sections of the State. In the State of Puebla is also situated the Tepeyahualco hacienda, where a famous species of bull for the bull-ring is raised.

The pastures in all the haciendas are of the natural kind, consisting of various species of "zacates" and herbs. Corn tops, stubble, barley and wheat straw are also fed to the animals, especially to those kept in barns and stables.

Stock-raising in the State of Puebla can be increased and the existing grades greatly improved by the right kind of crossings. The cattle should include a good species of milk-cows. The pastures in the State are excellent and all other conditions

of importance to the dairy industry are also favorable; consequently there is no reason why the State of Puebla should not be able to attain the results which are obtained in the State of Mexico, in the matter of producing very fine milk, cheese and butter, all of which could easily be sold out of the State, after supplying, probably in a more satisfactory way, the needs of the domestic market.

Farmers that devote themselves to the rearing of bees are not numerous in the State. This should not be so. The products of this industry are in great demand and all the necessary elements for its success are there; therefore, it deserves to a far greater extent the attention of enterprising persons.

The raising of poultry in a more scientific manner deserves also more and better attention on the part of the people of this State. A fairly good grade of turkeys, the native home of which is really the Mexican territory, is raised here, but there is ample room for increasing and improving this valuable fowl.

QUERETARO

As in the rest of the Republic, the inhabitants of this State also show a marked predilection for the raising of live stock, preferably of cattle, which yields the best financial results and for which the general conditions prevailing in the State are best suited. During the rainy season the plains are invaded by great numbers of cattle, but as soon as the winter sets in, they retire to the ravines and the valleys which offer better protection against the inclement weather.

Some of the haciendas that have a number of

cattle, nearly all of them located within the district of the city of Queretaro, are the following: La Muralla, Laborcilla, de la Torre, El Pino, San Diego, Cofradia, Santa Barbara, El Ciervo, Corral Blanco, El Rincon, El Ranchito, Los Espinos, Casa Blanca, Bravo, La Griega, Galeras, Negreta, Atongo, Espejo, El Alamo and a number of others.

All the live stock that is raised in this State belongs to the rachitic native grade.

The stock that lives in the open feeds on natural pasture, consisting of "zacate borreguero," "zacate grama" (*paspalum distichum*) and other species of the same grass, of "aceitilla" (*bides leucantha*) and other herbs.

General conditions are favorable for a more extensive development of the stock-raising industry, but the cattle should also be greatly improved upon by procuring a better grade of stock. Queretaro is located in a peculiarly favorable section which is crossed for a long distance by railroad lines, and therefore has ample facilities for selling all it can produce in the line of stock and the by-products thereof.

For the reason that there is a constant and good market for what can be produced, the raising of poultry deserves more attention than is given to it at present. Better grades of fowl, fed in a proper way will necessarily produce better financial results.

Nobody in the State engages in bee-keeping, at least in a way worth while mentioning, not because it cannot be done, for everything exists to make the successful bee-rearing possible, but simply because the people have had no stimulus from anywhere or

from anybody to devote some of their time to an industry which requires little work or outlay of money, yet yielding products for which there is a constant and great demand.

QUINTANA ROO

There is no such thing as raising of live stock in the Territory of Quintana Roo itself, but the island of Cozumel has about four thousand heads of cattle. Then there is a certain amount of cattle around the villages of Solferino and Chicila, belonging to the El Cuyo Company, as is also in the section of the village of Santa Maria. Large areas of natural pasturage are found all along the coast and in some parts of the interior of the country; advantage could be taken of these for the establishment of large stock farms. As for the raising of hogs on a large scale, it would be an easy matter to plant yucca, prickless-pear trees and a number of other plants, all of which constitute a splendid feed for hogs. Then there is in the Territory a great abundance of a wild-growing tree called "ramon," the leaves of which are one of the best fodders for horses, mules and goats; the fruit of this tree is splendid for the fattening of hogs. Quintana Roo, as already said in other chapters of this book, is an entirely undeveloped country, where nothing is done, and where everything remains to be done. People coming to Quintana Roo to settle or to engage in the different kinds of business for which there is a splendid field, will find conditions for stock-raising particularly favorable. Mother Nature has endowed most lavishly this section of the Mexican Republic; here we have considerable stretches of

natural pastures, splendid forests and any amount of fertile land; nothing but the energetic exploitation of all these riches is required.

SAN LUIS POTOSI

This State is one of the most important from the point of view of stock-raising; the Huasteca section of the State has large haciendas which pay much attention to cattle-raising, there being some very good breeds, the result of careful crossing, which makes the cattle among the best, both for slaughter and for dairying purposes. Nearly all the large farms of the State engage in cattle-raising; among these may be mentioned the following: Angostura, Peotillos, Bledos, Ojo de Agua, Gogorron, El Llano, Derremaderos, La Joya, Javali, Jesus Maria, and Herradura, which, besides being to a very large extent agricultural, indeed mainly so, devote considerable attention to the raising of good live stock. Then there are a number of coffee and fruit-growing estates which at the same time do some cattle-raising. The hacienda of Guanama is a grower of "ixtle" and also a considerable raiser of cattle; Preasa de Guadalupe and Anexas have "ixtle" and cattle; so have the plantations of El Salado, Pequenuelo, Santa Teresa, Cruces and many others. Other plantations are chiefly devoted to the cultivation of sugar-cane, but are at the same time cattle-raisers.

The pasturage is natural in all parts of the State, the guava fruit being much liked and eaten by the cattle in the Huasteca section. It makes excellent milk, and as this fruit is abundant and springs up naturally, it is turned to account in this manner, for

want of any other outlet. The pastures are composed of various species of "zacate" and other grasses, all of them being of spontaneous growth and in great abundance, forming veritable forests in which the cattle can roam at will. In the western and central sections of the State the most prevalent kind of pasture is the "zacate borreguero" (lamb grass). For stall-fed cattle, alfalfa and oats are cultivated in various parts of the State, although not to such an extent as to make these crops worth mentioning.

Cattle-raising has a magnificent future. The pasturages are of the very richest kind, in the first place; then there are also markets such as Tampico, Aguascalientes, Monterrey, Mexico and other towns, especially on the frontier, which can take all that can be produced. It seems that live-stock cattle is best adapted to the climate of the State, although hog-raising could be developed with excellent results. In many parts of the Huasteca section there are immense herds of hogs, which are perfectly suited for the market, and do not require special feeding, there being an abundance of food for them in the grasses and especially the fruits which go to waste in the region. The amount of stock-raising, of both classes, can easily be doubled in this section with splendid prospects of success.

The cattle-raising industry could be very much increased, and thereby create an opportunity for the extension of dairy products, for which there would always be a ready market in the State itself and in various places throughout the Republic.

Poultry-raising is very little engaged in, the same is true of bee-culture, although there are excellent reasons why both should be carried on to a greater

extent: poultry-raising, because the inhabitants of this section could have a large quantity of eggs, a form of nourishment which is very wholesome and which could be popularized and cheapened, and, bee-raising because there are flowers in endless variety and quantity for the bees to feed upon.

SINALOA

Conditions in this State with regard to the raising of live stock are similar to those that prevail in the States of Sonora and Nayarit. The people particularly favor cattle, of which fairly large numbers are raised, mostly stock obtained from the crossing of the native breed with foreign grades. Some haciendas prefer the foreign stock altogether and raise no other but pure breed. The other kinds of stock, such as horses, mules, donkeys, sheep, goats and hogs are also receiving attention. The mule here is a large-sized animal, preferably employed in the carrying of the products across the sierras.

There are in the State quite a number of haciendas, partly or entirely devoted to the raising of live stock, such as those of El Roble, El Camelote, Las Higueras, Los Angeles, La Labor, El Carmen and others.

The pastures are generally of the natural kind, consisting of grasses and herbs of different species, and also of certain fruits, such as the guave and the fruits and leaves of the "capomo" (*brossium alicastrum*). The hogs feed also on different roots and tubercles, like the roots of the "jicama" (*dahlia coccinea*) and others.

All conditions required for successful animal husbandry are in Sinaloa such as to permit of a consid-

erable increase of live-stock raising. At present about 10,000,000 liters of milk are obtained annually, not counting, of course, the quantities that go into the making of some 2,000 tons of cheese and 460 tons of butter. The cheeses of Sinaloa are fairly well commercialized, especially the kind manufactured in Mocorito. The hides are tanned and otherwise utilized in the State itself. The people in this State are particularly interested in the stock-raising industry; therefore, it could and should be extended and possibly improved by the introduction of finer grades; such as the Jersey, the Guernsey, the Durham and others. Andalusian stallions should be imported, as this kind of breed, elegant and high-spirited, is the one preferred by the Mexican horsemen and is well adapted to the climate and soil of this section of the country. As for mules, it would seem that for riding and other purposes in the mountainous sections the best stock is obtained from the crossing with the Andalusian animals, while the Texas mule gives better results than the former in the different agricultural activities.

In this State as well as in many others it would certainly be profitable to acclimatize the "tapir."

There is plenty of room in the State for a more extensive exploitation of the by-products of the cattle-raising industry.

The bee-rearing industry has already quite a number of adepts in this State; some 260 tons of honey are produced at present, on the average every year, and 120 tons of wax, though the latter does not come entirely from the bee-hives, part of it being obtained from the Campechea-wood (*hematoxylon campechanum*).

Poultry-raising is attended to in a certain way, but not by strictly scientific methods which if followed would make it really a profitable business undertaking. The "chacalaca," a kind of wild fowl (*ortalis vetula*) is often found amongst the domestic fowls; this bird furnishes an excellent meat. Here, as well as in all other parts of Mexico, the turkey, generally known in Mexico under the name of "guajalote" (*meleagris gallopavo*), is especially raised for use in the preparation of the national dish called "mole de guajalote."

SONORA

This State is certainly one of the leaders in the raising of live stock. In this regard it has been greatly influenced by its proximity to the United States; its cattle are of the large-sized grades which predominate in the North American Union. The following data concerning the by-products of the cattle-raising industry give a fair idea of the importance it has attained in the State of Sonora. About 10,000,000 liters of milk, 6,000 tons of butter and 1,000 tons of cheese are produced on an average every year. These figures could be greatly increased by simply taking full advantage of the abundance of cows, a large number of which roam about with their calves, without being milked.

Special attention is given in this State to the raising of live stock as the only means to turn to account its vast extent of territory covered with pasture.

The pastures are, as a rule, of the natural kind that grows spontaneously, viz.: grasses, herbs and the leaves of several species of trees and shrubs. Alfalfa, barley, stubs, and corntops are used as fodder for the animals kept in barns and stables.

There is plenty of room in the State, especially in the neighborhood of the rivers in the southern section of the State, near Guaymas, and in other sections, for the increasing of the live-stock production, particularly cattle. The northern and to some extent the northwestern section, with the exception, of course, of the desert, are suitable for the raising of sheep and goats.

The principal live-stock farms in this State are the following: Cerrillos, Mayobampo, Huamuchil, Labor, San Vicente, El Charco, El Prieto, Molina, Ojo de Agua, Providencia, El Mosco, El Ocuca, Pena Blanca, Chupadero, San Esteban. There are a number of other stock farms of minor importance.

Hogs are generally raised by the poorer class of the population for the production of lard as well as meat for the table.

No bee-raising worthy of the name is done in the State, though the fields and woods furnish any amount of flowers and sweet-juice containing plants.

As to poultry-raising there is probably not a single house in the country that does not raise a number of fowls, but nowhere on a large enough scale to constitute an industry in itself. Those that would engage in it, would certainly reap substantial gains, since in the State itself and across the border there is always a good market for poultry products.

TABASCO

Live-stock raising is another field in which Tabasco prospers, and could be made to do so even to a larger extent. The pasture fields with feed of unsurpassable quality and facilities for the constant watering of live stock at short distances, allow cattle

to develop in these regions without practically any care at all. Milk-cattle thrive especially well here, as they are best suited to the conditions of the section, but this does not mean that the State is not suited to other classes of live-stock raising. It would be easy to stock the flats of Tabasco with droves of high grade cattle. All the haciendas of the State devote themselves to the raising of cattle, and at the same time to agriculture and timber-cutting. We may mention some of them: San Isidro, Zaragoza, Chable, San Antonio, Tamarindal, Claudio, El Retiro, Gracias a Dios, Nuevo Leon, Reforma, Mulato, Jobo, El Playon, San Bernardo.

The live stock of Tabasco, whether due to the favorable conditions under which it is raised or the special care which it has been receiving, is of fair size and grade, although probably not of a very well defined and pure breed. It would be easy for farmers here to improve their cattle by crossing them either with milking breeds for the dairy industry, or with heavier breeds in the case of those intended for the meat market.

Pasture is natural everywhere, as in this part of the country there is always green grass; it is perpetual Spring here, and cattle choose the green pasture in preference to the drier meadows. So that in this State we do not have the picture of desolation presented by the cattle on the Central Plateau, which seems to fade away in the winter season. Here there is always plenty of food for live stock, however numerous it might become.

Milk-producing cattle should always be preferred, owing to the fact that all the products can be turned to account and a ready market for same is awaiting in other countries, in consequence of

the excellent quality which the high grade feed insures.

The reasons given for the development of the cattle-raising industry are applicable in the case of bee-keeping as well. The floral wealth of the forests goes to waste, without any use whatever being made of it. It could be easily utilized by means of busy hives of bees that would supply the market with an article in great demand today.

Poultry-raising might also be engaged in, but the people of Tabasco give very little attention to it. These are small industries which might be engaged in along with others in this State, and would give the most splendid returns. The poultry could, after all, be looked after by the women, who would have an opportunity of attending to an easy business which requires little capital.

TAMAULIPAS

This State has made real progress in the matter of raising live stock. Its great plains of Jaumave, Las Rusias, Palmillas, Santa Barbara and others give food and shelter to a large number of cattle herds, the quality of the animals showing clearly the efforts of the stock farmers in regard to bettering the stock by means of crossing it with good foreign grades. Cattle is the kind of stock the farmers prefer, as being productive of larger profits. It produces on the average every year more than three million liters of milk, 30 tons of butter and more than 100 tons of cheese. In this respect the State of Tamaulipas is not inferior to other States, and superior to a great many of them; it is probably ahead of all the other States of the Republic in the

matter of producing tanned hides and articles made of leather, such as saddles, etc.

All the haciendas of the State devote at least part of their efforts to the raising of live stock. Some of the most important are the following: San Jose de las Rusias, Paso de Barberena, El Sabino, Valle Blas, Las Rusias, San Jose, El Galeno, La Gloria, El Soliseno, Santa Teresa, Rio Bravo, La India, San Joaquin, El Porvenir, Los Cavazos, Jarachina.

The pastures are generally of the natural kind, including different kinds of "zacates," "aceitilla," the tender sprouts of the mesquits, leaves and fruit of "capomo," the fruit of the guava-tree, etc., etc. For the cattle kept in barns or stables, especially the horses, the corntops are utilized. Sheep and goats which abound in the northern section of the State, feed on zacate, "lentiscus" leaves (*forrestiera philliroideas*), the leaves of the "encinilla" (*croton dioicus*), "candelilla" and other herbs.

It is perfectly safe to state that from the time the craze for petroleum started in this region all other important enterprises which would promote the development of the State have been neglected. People come here from everywhere, all in the belief that the finding of gold, *i. e.*, oil, is just a matter of reaching out their hands, but nobody comes to engage in the other branches of activities, some of which, as the raising of live stock, for instance, offer the best chances in the world to build up a fortune. The pastures in the State are excellent, and the climate is one of the best for the raising of all kinds of live stock.

Cattle-raising could be increased in the region of Tula and Jaumave; horses, sheep and goats thrive best in the northern and central sections of the State.

The bee-rearing industry is well under way in this State, producing about 300 tons of honey and 40 tons of wax per annum. With a little more energy and attention on the part of those that are interested in this line of business, many times as much as is produced now, can be obtained, especially in the south of the State, where there is an abundance of what the little bee requires.

There are really good reasons why far-sighted business people should fully and scientifically engage in the poultry-rearing business in this State, where the many important oil camps by themselves constitute a very desirable market for all that can be produced in this line.

TLAXCALA

Nearly all the haciendas of the State devote their attention to live stock, and even those farmers who are engaged principally in the production of "pulque" endeavor to raise stock, as this is their only means wherewith they can retrieve the loss of the "maguey" fields. As a matter of fact, the cattle graze freely upon the large plains of Tlaxcala among the maguey plants, without injuring the latter, which the cattle do not like as food and without detriment to the subsequent product of the plant. Some of the haciendas which have live stock, although they are far from considering themselves cattle ranches are as follows: Cuesillos, San Antonio, Techalote, Zoquipa, San Miguel, Amantla, La Luz, Recoba, Ixtafiayuca, Tlatzalan, San Nicolas el Grande, San Cristobal and a large number of other plantations.

The pastures are almost entirely natural: "za-

cates" and other grasses in which the region abounds, all of which are of a quality which allows of the development of the stock-raising industry. The live stock here is in general of the spare and deteriorated local type but, in view of the high quality of the pastures and their abundance, we are of the opinion that the latter would be capable of supporting better and heavier cattle than they do at present. The land is especially suitable for the raising of donkeys rather than horses, the flat open lands of Tlaxcala not furnishing much protection either from wind, rain, or the great heat of the day. There are no large trees under which live stock may take their midday "siesta." For the same reason, the raising of mules may also be recommended. Horses should be raised more in the Huamantla and Puebla valleys, where the maguey plant has ceased to be the predominating cultivation and where there are woods and plenty of watering places for the stock. Both sheep and goats would thrive in the State.

The same reasons which have been instrumental in making Toluca develop its dairying and allied industries, exist in Tlaxcala as a rule. High table-lands grow the same type of grasses in Tlaxcala as in the high valleys of Toluca, and the same results would be obtained. In the State of Mexico there has been a slow though steady replacement of the native type of stock with milk-giving breeds, and the same is to be recommended in Tlaxcala. It is impossible to attempt to develop and extend the dairying industries with the present cattle, as this has only barely enough milk for the raising of the young, or yields a very small quantity of it to the cattle-owners. It is essential to improve the grade of

cattle if it is desired to turn the pastures of Tlaxcala to profitable account. Lard, butter, cheeses, would find a ready market.

Bee-keeping could be developed in this State, especially in the sheltered Valley of Huamantla, where it would be safe for the bees and afford them more shelter against inclement weather.

Poultry-keeping might be engaged in to a greater extent, with very excellent results.

VERACRUZ

The live-stock raising industry is very well attended to in this State. The regions of the Huasteca and those in the south of the State keep enormous herds of cattle which is the kind of stock preferred by the farmers. But cattle is found not only in the sections just named; it is bred in all the "haciendas" (farms) even in those which are principally devoted to agricultural activities. Some of the most important haciendas are the following: Nopalapam, Corral Nuevo, El Sacrificio, El Tecomate, El Carmen, Tuzamapam, Mahuixtlan, La Orduna, Zimpizahua, La Capilla, Almolonga, Paso del Toro, La Ternera, Las Animas, La Peregrina, Tenampa, Concepcion Ceron, Tlaxcanta, Potrerillos, Catalan, etc.

The pastures are as a rule of the kind that grows spontaneously, and everywhere of excellent quality. The milk-giving cows receive generally the leaves and fruit of the "capomo" (*brossium alicastrum*) which have the peculiar property of increasing greatly the milk-producing power of the cows without in any way damaging its quality. It is also customary to give the cattle the bagasse of the cane

which serves greatly to nourish and fatten the stock. The corntops and the stubble are utilized for the same purpose.

Veracruz is a vast field for the raising of cattle; its soil can support much larger numbers of stock than those raised at present. It would certainly be a good step towards progress if the farmers would care to better their stock by means of appropriate imported grades. The native breed, as a rule, is small and does not carry the quantity of meat that the good pastures of the country should warrant. The milk-producing qualities of the native cows are far from being satisfactory, for often they do not produce enough to properly feed their calves.

There is still an ample field in the State of Veracruz for the further development of the stock-raising industry, especially in the central sections of the State. But better attention should be paid to increasing the corresponding by-products, such as cheeses and butter, for all of which there is a splendid market in the numerous settlements and towns in the oil-field regions of the State. Already at present the production of milk, butter and cheese is very large, but, as already said, there is a good market for a great deal more.

Some attention is given in this State to bee-rearing, but the quantities of wax and honey produced are not even sufficient to satisfy the local demand; it should also be remembered that, the various sections of the State being such a favorable field for this kind of industry, an increased activity in this direction would be amply recompensed, since there is always a ready market for wax and honey.

The reasons which we have given for the need of establishing regular poultry farms in the State of Tamaulipas apply also to this State. There could certainly be no better market for fowls for the table, and eggs than that offered by the native and foreign population in the numerous rich oil fields located in different sections of the State.

YUCATAN

Most of the plantations in this State have a certain number of live stock. There are also a few farms devoted entirely to the raising of cattle, but none of any importance. Still more insignificant is the raising of horses, sheep and goats.

The State has quite a large area of natural pastures, especially on the coast and in its eastern and southern part; these pastures are amply provided with watering-places. It would be very profitable to raise live stock on a large scale in the above-named sections of the State, chiefly cattle, but also horses, hogs, sheep and goats. There is in the State an abundance of "macal," a species of tuber, pumpkin, "jicama" and prickless Indian pear, all of which constitute a splendid feed for live stock. The extension of the raising of live stock would not only bring enormous wealth in itself, but should cause the exploitation of the by-products, such as butter, cheese and lard, of which at present practically all is imported from foreign countries.

Poultry-raising in a modern form and on a large scale would also offer good business prospects.

The raising of bees on a larger scale than has been done up to now and with modern means might yield splendid results.

ZACATECAS

Live-stock raising is in this State, as in that of Aguascalientes, the principal line of activity engaged in by the people. All kinds of stock are raised, but preferably sheep and goats for which the conditions of the land are most appropriate.

The grades of this kind of stock that are raised are fairly good. Nearly all the haciendas have more or less live stock, some of the most important being the following: Atotonilco, San Martin, Cieneguilla, Crunidora, Colorada, Santa Catarina and a number of other plantations or farms, some of which devote most of their attention to the raising of goats and sheep, while others raise preferably horses, but all of which as a rule have besides the preferred kind of live stock, a certain number of cattle.

As to the grades of the stock, they are in most cases of the native type, but very carefully selected and to some extent the result of intelligent crossing with imported breeds. Some haciendas have raised horses, cross-breeds from English, Andalusian and Arab stock. Andalusian and to some extent Texas donkeys are used in the production of mules; the sheep species is derived largely from the Merinos stock. The original native breed of cattle has been greatly bettered with Dutch stock as well as Durham. Some haciendas, such as Malpaso, Abrego, Ameca and others make it their specialty to raise steers for the bull-ring.

The pastures are of the spontaneously growing kind; in the northern section of the State "candelilla" grows plentifully and is eaten by the cattle. In the rest of the State the kind of grass that predominates is the "zacate borreguero." The horses

like to eat the tender sprouts of the mesquit tree and the "nopal" which serves at the same time to quench the thirst of the animals.

Some of the large haciendas have tried to solve the serious problem of procuring regular watering-places for the animals by building reservoirs and large pools or basins which are called "jagueyes." These improvements will have to be extended and multiplied in the State, in order to make possible the full exploitation of the fine pastures that grow there. The entire State of Zacatecas is extremely suited for the raising of live stock, but, as already stated, the watering problem must be solved first.

Under such conditions it would be possible to obtain far larger returns from the industry, especially from the milk products, which are bound to be of the finest quality, in view of the excellent pasture that is found in the State.

Nothing is done in this State in the matter of bee-keeping; the wax and honey consumed comes from the State of Durango. The truth is that this section of the Republic is not suited for this industry, due to the dryness of the soil and the consequent want of flowers in sufficient quantities.

Poultry-keeping is also neglected, without there being any real reason why this should be so; therefore, it would be profitable to introduce the raising of poultry on a large scale and a scientific basis.

CHAPTER V

COMMERCE

The Republic of Mexico is one of the few privileged countries in the world that can call themselves absolutely self-sustaining as far as natural resources are concerned. The country produces all imaginable raw materials for all kinds of industries, and in the matter of foodstuffs it should need nothing from the outside. In the production of minerals, especially silver ore and petroleum, it plays the role of a world provider.

All that Mexico needs is peaceful, rational and intensive development.

The commercial balance of Mexico in all essentials is in favor of the country, for it exports more than it imports.

The bulk of the Mexican trade is carried on with the United States, export as well as import. England comes next. Furthermore, Mexico does business to a larger or lesser degree with all the other trading nations of the world.

The official management of all commercial affairs in Mexico is in the hands of the State Department of Industry, Commerce and Labor,—*Secretaria de Industria, Comercio y Trabajo*.

Since the object of this book is not to give a "general" idea concerning all business conditions and possibilities that obtain in the Republic of Mexico, but a fairly complete knowledge of the economic

development of every one of the States and Territories that compose the country, we give in this chapter full details concerning the export and import trade of all the different sections of the country, indicating at the same time the banking facilities available in every State.

The general commercial conditions of each one of the States and Territories of the Republic, such as are shown in this chapter, give a fairly good idea of the possibilities for increased or new commercial enterprises. The commercial activity of each State is clearly shown by its export and import trade, which, of course, refer to the interstate commerce as well as to the trading with foreign countries. "Import" and "export" are terms which in our case have the significance of trading with markets other than those of the State itself.

AGUASCALIENTES

Export.—Silver is exported from Aguascalientes in large quantities in the form of bullion, both to the Capital of the Republic and to the countries abroad. Exportation of this product and other metals is no less than 38,000 tons of silver, 4 tons of gold and some 18,000 tons of copper, the product of its splendid foundry. Corn is shipped to the extent of 19,000 tons, the market for this cereal being the State of Zacatecas, also San Luis Potosi and Tampico; quantities of beans are also exported to the same places. The timber is partly used by the railways and partly by the mines of the State itself, only a small quantity being sent away. Fruit is sent, principally, to Zacatecas, and grapes go to San Luis Potosi, Zacatecas, Salinas and other places.

Import.—The State imports machinery of all kinds from the United States; and hardware from Germany; cashmeres and cloth come from the factories of the Federal District and those of Puebla and Veracruz, and a small quantity from abroad. The chocolate and vanilla used come from the States of Tabasco and Veracruz. The coffee used in Aguascalientes is chiefly from the Huasteca Potosina region (State of San Luis Potosi), mostly "Huasteco" and "Caracolillo" sorts, and a smaller part from Uruapan. Groceries in general come from the State itself and from abroad (United States mostly). Large quantities of different kinds of fruit come into the State from the States of San Luis Potosi, Queretaro and Michoacan.

Banking—Present banking facilities are offered by the "Comision Monetaria" and the "Banque Francaise du Mexique."

BAJA CALIFORNIA

Export.—The export trade of the Territory of Baja California consists principally of metals, mostly in the form of bullion; the quantities of copper, gold, and especially silver taken out of the Territory are quite large. Gold is abundant in this section of Mexico, and the absence of a more vigorous exploitation of this precious metal is chiefly due to the unwillingness or the incapability of the people,—native or foreigners, to submit to certain inconveniences, especially with regard to the scarcity of water. The Territory exports also tannin-yielding material, such as "cascalote," "palo blanco" (lissiloma candida), bark of the red oak (*quercus virgens*); furthermore, "orchilla" (*rocella tinctoria*),

salt, precious stones, pearls, tortoise-shell, fish, hides, vegetable oils, and a few other things in small quantities.

Import.—The Territory imports yarns and fabrics, especially the cheap kind, such as “mezclilla” (paper and salt cloth), cheap blanket cloth, percales, muslins, calico, etc.; also some glassware, cutlery and hardware, especially mining tools.

The export as well as the import trade is extremely limited in this State by the small number of inhabitants, which, as already stated in another chapter, scarcely reaches 50,000 people.

The foodstuffs are generally imported from other sections of the Republic, and the other articles come from the United States.

Pearls and mother-of-pearl shell go partly to the City of Mexico and partly to foreign countries.

The commercial houses that trade in the Territory are of little importance; there is not one that does any banking business.

There will probably be an increase in trade as soon as the port of Mazatlan, which is not far from the ports of Baja California, establishes direct communication with the State of Durango. This refers especially to the pearl trade, and to some extent to minerals, timber and fruit.

CAMPECHE

Export.—The principal articles of exportation in the State of Campeche are the fiber of a Mexican agave, known as sisal hemp on the American market and as “henequen” in Mexico, and the gum of the sapota-tree, called “chicle.” The yearly average quantity of sisal exported varies between 25,000

and 30,000 bales, each bale weighing generally 170 kilos; the yearly export of sapodilla-gum averages from 30,000 to 40,000 quintals (one quintal is equal to one hundred-weight, that is 50 kilos or 100 metric pounds). Coconuts, Campechea-wood and fine timbers are also articles of exportation, the United States being the market for all of them.

Import.—The principal articles imported into the State are the following: canned goods, candles, soaps, flour, lard, dry-goods, hardware, notions and groceries.

The eventual increase of the export and import trades depends entirely on the further development of the agricultural branches which constitute the main wealth, present and future, of this State.

Banking.—All banking business is done in this State through the "Comision Reguladora del Mercado del Henequen," the Mexican Exploitation Company, Roberto S. Boyd, Jose de la Pena & Hermano, Domingo Diego, Sucrs. Up to the time of the publication of this book there has been no regular bank in this State.

CHIAPAS

Export.—The State exports nearly all of its cultivated products, with the exception of those we have named in the chapter devoted to Agriculture: corn, haricot beans, sugar-cane, cocoa, coffee, cabinet-maker's woods, carpentry and construction woods, sisal fiber, vanilla, "lechuguilla," cheeses, fats, butter, tanned and untanned skins, fruits and small quantities of a few other articles.

All these products could be exported in much larger quantities and to an unlimited extent. Chiapas

could export enormous quantities of "pochote," *i. e.*, the cotton from the pochote-tree, sarsaparilla, various textile plants, dyeplants, live cattle, corned meat or "pemmican," salt, etc. Thus the export trade of the State is not as high or as active as the resources of the latter would permit. Workers and capital are needed to make this Federal unit one of great trading activity.

Import.—Import business is confined to such products as are not produced in the State, especially manufactured goods, machinery, implements, cloth, glassware, shoes, felt hats, office supplies, stationery, books, printing machinery, etc. The countries from which these articles are imported are almost exclusively the United States and to a smaller extent the South-American Republics on the Pacific coast.

Banking.—The principal banking establishments operating in Chiapas are: in the town of Tuxtla Gutierrez: Custo & Co.; in Tapachula: H. C. Letcher, Irillasca Hnos., the executors of the firm of Jose Revuelto. They engage in all classes of loan, financing, exchange and draft business, except the issue of paper currency.

CHIHUAHUA

Export.—The State of Chihuahua exports principally live stock, cattle as well as horses, mules, donkeys, sheep, goats and hogs, to other sections of the Republic as well as to the United States. It exports, furthermore, hides, preserved meats, some corn, beans, flour, Irish potatoes, tobacco, lentils, some timber, metals in the form of bullion and ore.

Import.—The articles imported include machin-

ery, automobiles, tractors, trucks, diverse cloth fabrics, petroleum, gasoline, paper, glassware, dry-goods, silks, books, cotton blankets, hats, shoes, etc. A large proportion of the machinery comes from the United States, and some of it from Germany, where also most of the hardware comes from, as well as the printers inks and dyestuffs; the shoes come mostly from the United States and some from the Mexican factories. Saddles come from Leon, Tamaulipas and other parts of the Republic.

There are plenty of opportunities in the State for larger commercial activities in the export as well as in the import trade.

Banking.—The following are the firms that do banking business in the State: In Chihuahua: Jorge Johnstone; Rafael Calderon, Jr.; Alberto V. Garcia; Hiriart Hnos.; Mariano Pacheco; David Russek & Co.; in the town of Casas Grandes: Genaro Galaz; in Ciudad Juarez: Compania Bancaria de Ciudad Juarez, S. A.; David S. Russek & Co.; in the town of Parral: David S. Russek & Co.

COAHUILA

The prosperity of the State in agriculture, in mining and in various other fields of human activity make commerce in general very prosperous; it is very active, in the export as well as the import trade.

Export.—Since the State produces a great deal more cotton than it can utilize in its few factories, much of it is exported to the factories of the States of San Luis Potosi, Guanajuato, Puebla, Tlaxcala, Veracruz and the Federal District. It exports also large quantities of coal. The coal mines of this State produce an average of 1,000,000 tons every

year, most of which leaves the State, either for other sections of the country or the United States. This State furthermore exports not less than 50,000 tons of the "ixtle" fiber; the "guayule" produced in this State and the one coming from the States of Durango and Zacatecas go to foreign countries via Torreon, Coahuila. It exports also brandy of an excellent quality, the kind distilled in Cuatro Ciénegas and Parras deserving special mention. The cotton is exported either directly by the producers themselves or by the "Compania Algodonera Industrial"; this concern makes it its business to procure suitable lands for those that wish to plant cotton, and to get hold of all the cotton it can for its export trade.

Commercial conditions in this State are excellent, for there is more demand for what it produces than it can supply.

Since the State produces only certain articles, it has to import many others either from other parts of the country or from foreign lands.

Import.—Coahuila imports chiefly agricultural implements and machinery in general, also dry-goods, shoes, groceries, cereals, books, etc., and all the other articles which the State does not and cannot produce itself. Hardware is mostly brought from Germany; machinery, automobiles, trucks, gasoline, dry-goods (partly), groceries, paper (partly) are imported from the United States.

Banking.—The banking institutions that operate in the State are the following: Banque Francaise du Mexique, La Comision Monetaria, La Lagunera Agricola, David S. Russek & Co., Celso Garza Gonzalez, all of these in the town of Torreon. Several of these concerns have branch houses in the most

important towns of the State. Some firms do considerable business in buying and selling live stock, cotton seed and similar products.

COLIMA

Export.—The State of Colima exports about 15,000 tons of sugar-cane, 2,000 tons of sugar, 400 tons of panocha or raw sugar, 1,000 tons of molasses, 250 tons of coffee, 200 tons of "cascalote," 500 tons of sweet potatoes, 40,000 tons of corn, 2,000 tons of rice; nearly all the fruit mentioned in the chapter on Agriculture, some timber, untanned hides, live stock and fish. The principal market for these products are Mexico and foreign countries, especially the United States and Canada. The export trade can be increased and certainly will be increased as soon as Colima begins to fully exploit all the products of its lands. The State, furthermore, exports a large quantity of salt from its excellent saltworks of Cuyutlan, Cualata, Pascuales, San Pantaleon, Guazongo, Guayabal, etc. About 20,000 tons of salt are produced in these works, most of which go to the interior of the Republic.

Import.—The State of Colima imports different clothes and wearing apparel, furniture, wines and liquors, groceries, dry-goods, notions, hardware, machinery, paper, books, etc. Most of these goods come from other parts of the country and partly from the United States.

Banking.—The following are the houses that do banking business: Salvador Ugarte, in the Capital of the State and in the most important towns of the State; several Commission Houses do similar business, as do also some of the merchants. All their

operations, of course, do not amount to much. The truth is that banking has not as yet been developed in the State.

DISTRITO FEDERAL

Commerce is very prosperous in the Federal District, as can be gathered from the fact that its population is largely made up of government officials, a very numerous element which consumes much without producing anything. Furthermore, a very large population dwells in a small area of the District which is a splendid commercial center. The import trade is, of course, very considerable, but the export is also quite important, comprising a number of articles which are manufactured within the territory of the District.

Mexico City, the Capital of the Federal District and at the same time of the Republic, plays the role of a huge commission house, and as such it receives numberless articles from the different foreign countries and from the different sections of the Republic and re-expedites them, we might say, all over the country.

Export.—Of its own products the District exports, mostly to the interior of the country, vegetable oils, starch, chemical products, furniture, ammunition, perfumes, wines, flours, tanned hides, cement, chocolate, candies, silk, glass, mirrors, machinery. The fine cigarettes produced by the factories in the Federal District also form an important item in the trade; they go all over the country and even to foreign markets. The Mexican export trade to foreign countries mostly includes raw materials; in the Federal District there are no raw materials in sufficient quantities to be exported;

consequently there is no export trade to foreign countries, except for products in transit from other States.

Import.—The import trade is, of course, very important and includes all imaginable articles for everyday use, and for special purposes. Anything one might desire or need can be had in Mexico City; here are stores of all kinds, many of them fashioned after the large department stores of the great American cities. As already said, Mexico City is to a certain extent the central market or depository for all the other parts of the country. It would be a difficult task to enumerate all the commodities that are brought in, either from the other States, as certain raw materials and foodstuffs, or from foreign countries, such as automobiles, trucks, farm implements, machines and machinery of all kinds, luxury articles, wearing apparel, fine furniture, notions, groceries, paper, books, etc., etc.

Banking.—There are a large number of banking houses in the City of Mexico that do every kind of fiscal business, except the issuing of paper currency. Such banks are the following: Banque Francaise de Mexique, Banco Asturiano, American Foreign Banking Corporation, Anglo-South American Bank, Zembrano & Hijos, Eulalio Roman, Banco Central Mexicano, S. A. Banco de Londres y Mexico, Banco Germanico de la America del Sur, Banco Hipotecario de Credito Territorial Mexicano, S. A., Banco Internacional e Hipotecario de Mexico, Bank of Montreal, Caja de Prestamos para Obras de Irrigacion y Fomento de la Agricultura, S. A., Credito Espanol de Mexico, Mexico City Banking Corporation, Mortgage & Loan Banking Company.

DURANGO

Both export and import are engaged in.

Export.—Cotton is exported to the extent of 20,000 tons, on the average every year; corn, 750,000 hectoliters; beans, 40,000 hectoliters; wheat, 9,000 tons; guayule, 5,500 tons; fruits of various quantities, and an immense quantity of timber and woods.

Export trade would improve, if the methods of cultivation were more scientific and the crops were turned to fuller account.

Import.—The State imports cattle for meat supply and for the dairying industry, as well as for breeding purposes, the markets from which they come being the States of Chihuahua, Nayarit and the United States. Machinery, cloth, notions, hardware come practically all from the United States.

Banking.—The State of Durango possessed years ago an issuing bank, that of Durango, and also branches of the Bank of London and Mexico, the Banco Nacional de Mexico, the Banco Minero de Chihuahua, Banco de la Laguna, which did splendid business. At present there are no banking institutions in the State.

GUANAJUATO

Export.—The State exports an enormous quantity of its products, mostly to other markets of the Republic. Large quantities of cereals leave the State: of corn not less than 200,000 tons; beans, some 10,000 tons; sweet potatoes, 3,000 tons; peanuts, 2,000 tons; barley, 9,000 tons; chickpeas, 5,000 tons; wheat, already turned into flour, not less than 45,000 tons; it exports also large quantities of

fruit and manufactured goods, such as leather goods, common shoes, riding saddles, straw hats, crockery, blankets, shawls, soaps, mats, needle-work, jellies, cotton blankets, muslins, cashmeres, percales and woolen fabrics.

Import.—The State of Guanajuato exports a great deal more than it imports; its trade balance is therefore in its favor. The articles imported into the State comprise machinery of different kinds, especially farm implements, for gradually the farmers of this State are adopting the most modern methods and machinery for their work; automobiles, trucks, rubber goods, fine clothes, silk and woolen fabrics, high grade shoes, felt hats, hardware, typewriters, sewing machines, fine crockery, cutlery, paper, books, etc., etc. Most of what is imported comes from foreign countries. Agricultural and other machinery, tractors, trucks, rubber goods and automobiles come from the United States; some machinery, hardware and other articles, such as dyestuffs come from Germany. France and England furnish the finer kinds of silks, perfumes, toilet articles, cashmeres, woolen and fine cotton goods, books, glassware, etc. A small quantity of the goods of this class comes from the Mexican factories. Guanajuato imports large quantities of cotton from the Laguna section in the States of Durango and Coahuila. Some cotton it receives from the States of Colima, Michoacan, San Luis Potosi and Tamaulipas. Cotton is the only kind of raw material which the State imports for its factories, and great efforts are being made to make the cotton-using industries independent of outside sources. Guanajuato imports also sugar, molasses, wines, beer, liquors, cigars, national and American groceries, canned meats, etc.

Banking.—In consequence of its commercial, agricultural and industrial development, the State does a considerable banking business through the following houses: Bruno Cortez & Co., Felipe Osante in Sinaloa; Banco Nacional de Mexico, Compania Comercial del Centro, in Irapuato; De Votie & Lujan, in the city of Guanajuato; Banque Francaise du Mexique, Luis Caballero, in Acambaro. These firms execute all kinds of banking transactions, with the exception of the issuing of paper currency.

GUERRERO

Export.—Although considerably handicapped by the lack of proper means of transportation, the State of Guerrero sends out its products to different parts of Mexico and even to the United States. It exports cotton, sesame, sugar-cane, brown sugar, molasses, bee-honey, wax, cheeses, butter, tropical fruit, castor oil, cotton-seed oil, coconut oil, sesame-seed oil, campechea-wax, cane-rum, essence of "linaloe," straw hats, cabinet-making and carpentry woods, silver, lead, copper, tin, cinnabar, coal, opals, hides, mats, marble, gold and rubber. The quantities which leave the State are more or less two-thirds of the total given in the chapters on Agriculture, Forests and Mining.

The exportation of metal represents about five million pesos (2,500,000 dollars) a year. As to vegetable oils, it exports annually about 500,000 liters of cotton-seed oil, 100,000 liters of coconut oil and more than 500,000 liters of sesame-seed oil. These figures show that there is in this State a very active trade, in spite of the natural difficulties of getting the products out of its territory.

Imports.—As to the import trade, the State of Guerrero buys large quantities of cloth fabrics and clothes, paper, books, diverse manufactured articles, machinery, groceries, wines and liquors, beer, notions, dry-goods, hardware, cigars, shoes, etc., etc. These articles come to a large extent from other markets of Mexico, and some of them from the United States and other foreign countries. Automobiles, tractors and trucks are brought exclusively from the United States.

Banking.—At present there is no firm in the State of Guerrero that engages mainly in the banking business; a banking institution is, of course, very much needed for the easier and further utilization of business opportunities in this State.

HIDALGO

Export.—The State exports metals: gold, silver, copper and others; cement, especially the kind called Portland which is made in Tolteca, and of which not less than 12,000 tons are annually sent to the Capital of the Republic; lime in large quantities, "pulque," no less than 70,000 hectoliters per annum; bricks in large quantities; also rum, sugar, brown sugar, common earthenware, flour, some soap, yarns and textiles. Almost all this goes to the City of Mexico, whence it is re-exported to other markets or is locally used. The State exports woods, although not in very large quantity as already stated in another chapter.

Import.—The State imports cashmeres, cloth, sheets, blankets, hats, shoes, beer, wine and liquors, national and foreign-made groceries, mineral waters and other beverages, machinery, cutlery, fine porce-

lain, glassware, hardware, high grade furniture, drugs, etc.

The imported products come, to a large extent, from the Mexican Republic: some cashmeres, clothes, hats and shoes are imported from abroad. Agricultural and metal-working machinery, looms, etc., come from the United States; hardware and drugs come principally from Germany. Wines are of Spanish and French manufacture, beer and mineral waters are made locally.

The shipments of cereals and other agricultural products are made direct from the haciendas or ranches producing the commodities.

Banking.—The banking institutions are the following: Enrique Pineda, the Banco de Hidalgo, and the branch of the Banco Nacional. As is the case with similar institutions in the rest of the country they only engage in loan, draft and discount business.

JALISCO

In view of the large production in the agricultural, live-stock raising and industrial fields, commerce is naturally very active in this State, and would be considerably more so if there were proper means of communication between all the sections of the State.

Export.—The export trade is considerably larger than the import trade, though the latter is also very important. Not less than 200,000 tons of corn leave the State; 6,000 tons of beans; 9,000 tons of chickpeas; 10,000 tons of sugar-cane; 500 tons of bee-honey; 40 tons of molasses; 2,300 tons of brown sugar; 600 tons of tobacco; 300 tons of rice; 6,000 tons of rum; 2,700 tons of "tequila"; 5,400 tons of flour; 36,000 tons of "capulin"; 7,000 tons of

peaches; 2,000 tons of "jicama"; 3,000 tons of sweet potatoes; 1,400 tons of peanuts; and quantities of other fruits and vegetables; furthermore, 60 tons of beeswax; 3,000 tons of cheese; 100 tons of butter; 30,000 liters of coconut oil; 32,000 liters of linseed oil; 4,000 liters of castor oil. The State of Jalisco exports also a large quantity of timber, especially for the cabinet-making, carpentry and construction industries, some fish, live stock, tanned and untanned hides, and skins; somewhat more than 2,600 tons of lard; metal bullion, crockery, especially earthenware known in the country as crockery of Guadalajara which is greatly appreciated; these goods have not only utilitarian but also art value; some "chicalote" oil is also exported, coffee, indigo, dyestuff, vanilla, some coal, marble, "tecali" (a kind of transparent marble); fine crockery, alcohol, cochineal, good cloth fabrics from its factories of Atemajac, Experiencia, and Rio Blanco, such as cotton blankets, woolen blankets, coarse cotton cloth, cheap blanket cloth; also needlework, glass, candles and a number of other articles.

The export trade of the State can easily be increased, especially as soon as means of direct communication with the States of Durango and Zacatecas have been established, for then Jalisco can easily secure the entire trade of these two States. As soon as the Southern Pacific road is finished, Jalisco will be able to obtain the markets of the western coast of Mexico with its many products.

Import.—The import trade consists of national and foreign groceries, wines, silk, woolen and cotton fabrics, especially the fine kinds, machinery of all kinds, fine furniture, glassware, notions, hardware, tractors, automobiles, trucks, petroleum, gasoline, fine crockery, house and office furniture, stationery,

books, electrical articles, shoes, jewelry, canned meats and fruit, etc., etc.

Many of the articles named come from different markets of the country, others are imported from foreign countries, especially the United States.

Only part of the cotton consumed in the factories of Jalisco is produced in the State; a large amount has to be brought in from the States of Colima and Michoacan; the wool used comes from the sheep raised in the State, and some is imported from the States of Zacatecas and Aguascalientes. Petroleum and gasoline are imported from other parts of the country. The City of Mexico furnishes most of the books, especially the textbooks for the elementary schools.

Commerce in this State is very important. There are many commercial firms which either import directly or serve as intermediaries between the local market and the other national and foreign markets.

Banking.—The banking business done in the State of Jalisco is of great importance, consisting of every kind of banking operations, with the exception, of course, of the issuing of paper currency. The most important of these firms are the following: Mendoza & Co., in Ciudad; Guzman, Brewer & Gaysinsky, Comision Monetaria, Banque Francaise du Mexique, Banco de Jalisco, Salvador Ugarte, A. R. Downs, Federico Kunhardt & Hno., Martinez Gallardo & Robles Gil in the city of Guadalajara; in Lagos de Moreno, Perez Sandi Hnos.; in Ocotlan, Antonio Cortes; in Sayula, Jose Eguiarte; in Tecalitlan, Cueva Lopez.

MEXICO

Export.—The State of Mexico is a very active commercial center. On special trains it sends twice

a day most of the milk supply for the City of Mexico. The quantity of milk annually exported in this way amounts to about 60,000,000 liters; it exports also "pulque" to the amount of some 20,000 tons; "tlachique," 32,000 tons; cheese, 300 tons; lard, 500 tons; and large quantities of beer; also preserved meats, vegetable oils and soaps, blankets and various other manufactured goods, as well as about 200,000 tons of corn and large quantities of fruit. Mostly all of these articles are shipped to the City of Mexico, whence they are re-shipped to other points of the Republic.

The export trade from the State could be enlarged by establishing more sugar mills and by installing modern machinery for the more intensive utilization of milk products.

Import.—The State imports the following goods: cashmeres, cloth, earthenware, glassware, hardware, matches, candles, petroleum, gasoline, high grade cattle, electrical goods, machinery of all kinds, etc. The major portion of these goods are of foreign origin, especially from the United States.

Banking.—The banking institutions in the State do very good business; they are: the National Bank of Mexico, the State Bank of Mexico and the French Bank of Mexico, which do the ordinary banking business and in this manner help in the development of commerce, rendered somewhat difficult, however, by the absence of paper money.

MICHOACAN

Export.—Michoacan being a very productive State, it ships a large part of its products to various markets in the Republic and, as we have already

stated in another part of this book, it would be capable of supplying the wants of the whole nation if it only had rapid transit facilities. It exports corn, a large quantity of rice, wheat, flours, sweet potatoes, oats, "cascalote," chickpeas, exquisite fruit, woods and metals, sugar, rum, brown sugar, sugar-cane, flax, tobacco, indigo, cotton, "ixtle," tanning bark, sesame, vanilla, "mezcal," "pulque," honey, untanned hides and skins, live cattle for the meat market, and many other products. Export could be increased by better transport facilities; this is the great need of the State.

Import.—The State imports every kind of machinery and machine parts, especially agricultural implements and machinery, as the wealth of the State is based upon agriculture; machinery for the sugar industry, there being several splendidly equipped sugar mills; machinery for the mining industry and also for many other purposes. This machinery comes chiefly from the United States and to a small extent from Germany. Michoacan imports cashmeres, worked cloth, sheets, hats, common blanket cloth and every class of manufactured products; furniture, silks, dry-goods, and hardware, the last being of German manufacture.

Many of the haciendas or farming estates must be considered important business houses, as they engage in independent export and import trades.

Banking.—Michoacan has an agency of the Comision Montaria for banking operations. The Banque Francaise du Mexique has the firm of Miguel Estrada, in the City of Morelia, as its authorized agent for the transaction of financial business in its name.

MORELOS

Export.—This State exports large quantities of sugar, sugar-cane, brown sugar, molasses, rum, fruit and timber. Not less than 45,000 tons of sugar leave the State, mostly for the market of the City of Mexico; of sugar-cane, some 500,000 tons every year; of brown sugar, 3,000 tons; of rum, 22,000 tons; of molasses, 35,000 tons. Morelos exports about 7,000 tons of rice, and as far as fruits and timber are concerned we may consider the quantities indicated in the chapters on Agriculture and Forests as export trade.

The export trade of the State could be greatly increased not only in the matter of its present products but also with regard to other articles which should be produced in factories established in the State, instead of all the raw material being sent out, as is now the case. Large quantities of fruit that go to waste, could be preserved and canned and sent away. Many articles which need a large percentage of sugar could be manufactured in the State, such as sweets, candies and chocolate. The main article of commerce of the State of Morelos is sugar. The growing of sugar-cane is the typical occupation of the people of this State.

Import.—This, of course, makes the State dependent on other markets for all such articles and products which it does not itself produce. It imports large quantities of fabrics of all kinds, machinery, especially such as is used in the cultivation, harvesting and utilization of sugar-cane. It imports also other kinds of machines and instruments, typewriters, sewing machines, etc., hardware, notions, shoes, wearing apparel, stationery, books, etc., etc.

Most of these things, especially machinery, trucks and other articles of this sort come from the United States; the national factories furnish the cheap kinds of cloth fabrics and yarns, cheap cotton blankets, cloth, percales, muslins, etc. Some machinery, electrical goods and hardware is imported from Germany.

Banking.—At present there are no banking institutions in the State to facilitate business operations, and commerce is probably greatly handicapped by this. Some of the firms established in the State do certain banking business through correspondents and agents of the banks of the City of Mexico.

NAYARIT

Export.—Though seriously handicapped by the lack of proper means of transportation, the trade of this State is of considerable importance, since it sends out large quantities of sugar-cane, corn, fruit, live stock, timber, cotton, sugar, tobacco and other articles.

Most of these articles, such as the fine timbers, fruit, cheeses, butter, live stock, untanned hides, go to foreign countries, especially the United States; the interior of the country buys sugar-cane, sugar, brown sugar, molasses and palm hats. The natives of the States of Durango, Sinaloa, the northern section of the State of Jalisco and those of Nayarit itself call these hats "sombreros huicholes," for the reason that the Indians of the Huicholes tribe manufacture most of them. Those that travel in the sierras of Nayarit often observe large caravans of Indians who drive their beasts of burden, generally donkeys or mules, weaving at the same time these

hats for which they use the leaves of a palm-tree growing in that region and which they call "soyate."

Import.—The State imports large quantities of manufactured articles of all kinds, fabrics, cloth, cheap blanket cloth, felt hats, machines, paper, books, crockery, etc., etc.

Machines and many of the clothing articles are imported from the United States. Very little comes from other countries, due to the great distance and the lack of proper roads. This circumstance accounts for the shortage of many useful and perhaps necessary articles in the State.

Banking.—At present there are no banking institutions whatever in the State of Nayarit.

NUEVO LEON

Since the State of Nuevo Leon is a center of production of various manufactured articles, and is admirably situated to serve as a depository for and re-expedite the products of other States, it enjoys an active trade.

Export.—Nuevo Leon exports a considerable quantity of "guayule" (*parthenium argentatum*), 1,900 tons; of "ixtle" (*agave* sp.), 3,000 tons, exclusive of the quantities of these fibers turned into diverse manufactured articles; of "lechuguilla" (*agave heterocantha*), it exports 2,000 tons; also, certain quantities of onyx, white marble, coal, large quantities of beer, articles made of iron and steel, yarns and fabrics, mosaics, Portland cement, quarry stone, metals, soaps, alcohol, brown sugar, molasses, noodles, rum, cigarettes, etc. Furthermore, it exports a number of articles made of fiber, such as ropes, sacks, etc., brooms, tanned hides and skins,

saddles, live stock, candles, mineral waters, especially those of Topo Chico.

Import.—The State imports machinery, hardware, fine crockery, glassware, high grade fabrics and cloth, fine silk, cotton and woolen goods, paper, shoes, hats, national and foreign groceries, and a good many other articles, such as drugs, etc.

Banking.—As a natural result of its commercial activity the State of Nuevo Leon has a number of banking houses, among them: Banque Francaise du Mexique, A. Zambrano e Hijos, Sada Paz Hnos., Banco Nacional de Mexico, Banco de Nuevo Leon, Banco Mercantil de Monterrey, Comision Monetaria, Adolfo Larralde, Guevara Hnos., Ramon Elizondo, Guillermo Lopez, R. Martinez y Hno., Patricio Milmo & Hijos, Sucs.; all in the City of Monterrey. Rafael Leal, Concepcion Sepulveda in the town of Linares. Canuto Garza, Jr., Clemente Bortoni, in Lampazos.

OAXACA

Export.—The inhabitants of Oaxaca export the following articles: bullion which has been treated in its own smelting-works and of which the principal are: gold, silver, lead, copper, antimony and zinc; onyx, porphyry and marble, although not in very large quantities; "chicle" (sapodilla-gum) on a small scale; coffee, 2,700 tons; cocoa, over 300 tons; vanilla, about 10 tons; sarsaparilla, 30 tons; tobacco, rather more than 350 tons; sugar-cane, no less than 200,000 tons; choice woods and timber for construction; castor oil, about 200,000 liters; cotton-seed oil, 40,000 liters; cheese, 200 tons; a small quantity of rubber; small quantities of fruit; "pita" (the

fiber is one of the most important products of Oaxaca, and is the species called in botany "ananas macrodontes," of which a certain quantity is manufactured in the State into cord, sacking, rope, or cable, string, etc., and a large quantity is shipped in a raw state). Oaxaca also exports high grade palm-leaf hats, these constituting one of the most widespread industries in the State. Rice is produced in relatively small quantities; about 600 tons of it is shipped. Other export articles are: soaps, glycerine, cochineal, which produces a coloring material and lives in the cochineal fig-tree (of the "opuntia" species) growing in this section; tan-barks, indigo, dyewoods, etc. All these products go partly to the domestic market and the remainder are shipped abroad.

Import.—The State has to import large quantities of cloth, cashmeres, cotton goods, fine shoe-ware, hardware, dry-goods, silk goods, high grade furniture, glassware, machinery of all kinds, books, paper, etc., most of which come from the interior of the country and some from abroad, especially dry-goods and hardware, which come from Germany, cashmeres from England and France, and machinery almost exclusively from the United States.

Banking.—The principal banking houses, which carry on all kinds of banking business, are a branch of the Banco Nacional de Mexico and the firm of Manuel Sodi; they cover the whole of the State.

PUEBLA

Export.—The export trade of this State is very active; it is carried on especially with the City of Mexico and the town of Pachuca, and partly with

foreign countries by the way of Veracruz. Not less than 1,200 tons of rice are exported; somewhat more than 200,000 tons of sugar-cane leave the State, 1,000 tons of coffee, 80,000 tons of corn, 5,000 tons of beans, 300 tons of tobacco, 9,100 tons of Irish potatoes. It can be calculated that about half of the fruit produced is sold at the various markets of the Republic; the same is true of two-thirds of the timber taken out of the forests of the State. Live stock, untanned hides and skins, tanbarks, medicinal plants, coal, cashmeres, cloth, blanket cloth, common fabrics, shawls, hats, "ixtle," cordage, etc., are also exported from the State of Puebla.

We must make special mention of the magnificent marbles and onyx which the State exports either in blocks or in the form of finished articles artistically worked.

Import.—The State imports mostly manufactured articles, such as fine qualities of cloth and cashmeres, from England and France; fine crockery, machinery and other articles that are not produced or manufactured in the State itself.

Banking.—The following firms do banking business in the State of Puebla: Banco Oriental de Mexico, Banco Espanol Refaccionario, Compania Commercial, S. A., Martinez Pando & Co., Miguel Abad.

QUERETARO

Export.—Queretaro ships to other markets, outside of the State, a considerable portion of its products, in the following mean annual quantities: 8,000 tons of flour, 35,000 tons of corn, 2,000 tons of beans, 800 tons of sweet potatoes, and con-

siderable quantities of different kinds of fruit. Most of these goods go to the interior of the Republic.

The export trade could be greatly increased by enlarging every form of production for which the State offers all the necessary conditions.

Import.—The import trade of the State comprises fine grades of furniture, agricultural and other kinds of machinery, petroleum, groceries, wines, beers and liquors, cigars, wax matches, paper, books, glass, fine and ordinary crockery, shoes, cheap blanket cloth, woolen blankets, cheap fabrics, etc., etc.

These articles are mostly gotten from the national markets, but others, such as machinery and tools of different kinds are imported from the United States.

Banking.—The following firms do banking business in the City of Queretaro: Banco Nacional de Mexico, Banque Francaise du Mexique, Ambrosio Sanchez e Hijos, and the Comision Monetaria.

QUINTANA ROO

The trading of the Quintana Roo Territory is done mostly with the British Colony of Belize, British Honduras, and some of it with the adjoining State of Yucatan. Coconuts, sapodilla-gum and timber are exported to Belize, and from there partly to the United States and partly to Europe.

Some of the articles imported into the Territory come from the State of Yucatan, but most of them from British Honduras. The Territory as well as the Island of Cozumel import some groceries, tools, shoes, ordinary clothing, hats and cotton goods, tobacco, liquors and stationery.

The Indians of the Territory travel quite a distance to do their trading.

SAN LUIS POTOSI

The trade of the State of San Luis Potosi is one of the most important in the whole country. As home production is ample in many departments of industry as well as in agriculture for the supply of domestic requirements, the State has a large quantity of surplus products which it exports to various markets.

Export.—First of all San Luis Potosi exports the product of the sugar-cane, brown sugar and refined sugar, the principal market for these being Tampico, Aguascalientes and various towns in the center of the country, among them the Capital of the Republic. It exports to these same markets coffee (the “caracolillo” and the “huasteco” kinds); prickly-pear, “cheese” or paste which reaches several thousand tons, the State being the principal producer of the “tuna Cardona” (a cactus; bot. “nopal”) which is the plant from which the paste is made; it exports also fruits in various quantities; corn, something over 800,000 hectoliters; timber; robes, for which the State possesses the best factory in the Republic; “rebozos” (a kind of shawl), especially those made of very fine silk, which are chiefly sent to the Capital of the Republic and the previously mentioned markets of Tampico, Aguascalientes, Monterrey, Saltillo and other towns; articles made of “ixtle” fiber, such as sacks or bags, carpets, blankets, mats, etc.; high grade furniture, some of which is ultimately sold in the City of Mexico as imported furniture from abroad, though really

coming from San Luis workshops, which have no rival throughout the Republic; haricot beans, to the amount of 30,000 hectoliters; cattle for the meat market, especially to Tampico and towns in the United States.

The export trade is very important, but it could be very much more so if the various industries in the State were enlarged, industries which today are short of capital and workers, and especially suffer from a lack of initiative. It is necessary that in the Huasteca region more attention be paid to the growing of cotton for the factories and that in the central valleys the people should devote their efforts to the silkworm industry. There is also the need of companies to erect electric plants for the supply of cheap electric power to the factories.

The export trade is awaiting therefore the arrival of business men who are farsighted enough to do business on a large scale. In this connection we may state that the rope-making industry may be increased and its products exported in much larger quantities by the establishment of new factories, especially in the towns of the north and the west of the State. Fruit, if there were railways enough, would have a considerable export market, either fresh or in canned or otherwise preserved form. Each of the industries of the State of San Luis Potosi is capable of contributing to its export trade.

The exportation of the products we have named is generally done by the producers themselves, as for instance "ixtle" (7,000 tons), "guayule," a rubber-yielding shrub (800 tons per annum).

Import.—The import trade comprises machinery, agricultural implements, dry-goods, notions, perfumery, drugs, hardware, and numerous other

articles imported mostly from the United States, Germany, England and France.

Banking.—San Luis is a commercial center which does business on very liberal terms, and for this reason there are branches here of the Banque Française du Mexique, Zembrano & Hijo, La Monetaria, and other institutions which do an exchange and discount business, and even a loan business in some cases. They draw upon banks in Mexico City, in Tampico, and other towns in the Republic, and also on banks abroad.

SINALOA

As a consequence of general activities in this State, commerce is well developed, being represented by a number of firms which engage in the export as well as in the import trade.

Export.—Sinaloa exports sugar, "orchilla" (roccella tinctoria), soaps, tanned and untanned hides and skins, corn, chickpeas, cotton, some cocoa, coffee, fruits, timber, cheeses, butter, alligator hides, goods manufactured from all kinds of skins, articles made of "ixtle," "guapilla" fiber (agave falcata), sugar-cane, brown sugar, palm hats, etc.; also metals in the form of bullion, which are sent to the City of Mexico. Most of the articles named are sent to the interior of the Republic, but some go to the United States.

Import.—Sinaloa imports agricultural machinery and implements and machinery for other purposes, crockery, glassware, high grade furniture, cloth, cashmeres, glass, paper, books, stationery, and a good many other articles. Most of the import trade is done with other parts of Mexico and with the United States.

Banking.—The following are the banking institutions that do business in this State: La Comision Monetaria, Casa de Cambios y Comisiones la Internacional, Castello & Hijo, in the port of Mazatlan, but doing business all over the State.

SONORA

The State of Sonora carries on a very active trade.

Export.—Sonora exports very large quantities of chickpeas and other agricultural products, a good quantity of fruit, timber, especially brazil-wood, alder, "ahuehuete," "aguacatillo," sapota and a few other kinds; meats, hides and skins, tanned and untanned, "cascalote" (not less than 300 tons a year); cheeses (600 tons), butter (5,600 tons), etc.

Sonora, furthermore, exports large quantities of metals in the form of bullion, marble, onyx, jasper, graphite, rock salt and other products.

Import.—The State imports manufactured goods of different kinds, such as shoes, clothing, cashmeres, fine cotton, woolen and silk goods, hats, crockery, national and foreign groceries, wines, liquors, noodles, preserved meats, machinery of different kinds and for different uses, tools, furniture, automobiles, tractors, trucks, books, paper, stationery, etc., etc.

Banking.—The firms that do banking business in this State are the following: Sonora Bank & Trust Company, Compania Bancaria y Agricola de Sonora, Manuel I. Loaiza, Juan de Dios Castro, in the city of Hermosillo; the Sonora Bank & Trust Company (branch office) in the town of Nogales.

TABASCO

Export.—The State exports principally cabinet woods, such as mahogany, palisander, walnut, etc., which for a long time past have had splendid markets abroad. It exports fruit, especially the “roatan” banana, known by that name and that of “Tabasco banana,” very nutritious and of a splendid flavor; furthermore, cherimoyers, peaches, guavas, coconuts, and many other kinds of fruits are exported in the quantities mentioned under the heading of Agricultural Products, though it must be remarked that these figures do not in the least represent the real production or even an infinitesimal part of it. The figures we have given in the chapters on Agriculture and Forests must be taken solely as referring to what goes out of the State, that is to say, its exports.

Import.—The State imports a large quantity of manufactured products: machinery of all kinds, agricultural implements, cloth, cashmeres, glassware, cutlery, boots and shoes of Mexican and foreign manufacture; rugs, blankets, books, paper, etc., etc. Although it could be self-supplying in many articles which could be manufactured, under favorable conditions, locally, the State is dependent upon foreign markets for many articles of daily use.

Banking.—There are no banking concerns at present in the State which are worth mentioning, banking being one of the fields of activities which should be given more attention, as it is of urgent necessity. The business houses themselves act as correspondents and execute financial transactions for their correspondents, though such operations are not numerous.

TAMAULIPAS

Export.—The export trade of this State consists in the main of oil or petroleum, constituting at least one-fourth of all the petroleum exported from the Republic of Mexico; it exports also "ixtle" fiber, articles made of this fiber, leather goods, riding saddles, lard, live stock, especially cattle, tanned and untanned hides, timber, especially ebony, mahogany, and other fine woods for the cabinet-making industry, sugar-cane, brown sugar, etc.

Most of the crude oil is exported to foreign countries, part of it is used as fuel by the Mexican railroads and another portion of this production is consumed by certain industrial plants; some of the gasoline stays in the country, but most of it goes abroad; live stock goes to Cuba and some of it to other sections of the country; the lard is shipped to different national markets.

Import.—The import trade is very active and comprises all the machinery and implements used in the oil fields, packing material for the shipping of oil and the different by-products of it, agricultural machinery, machines of many kinds, diverse cloth fabrics, crockery, wearing apparel, and a number of other articles, such as hardware, glassware, notions, groceries, etc.

The import trade is mostly supplied by the United States, and in some cases by other foreign countries and Mexico itself.

Banking.—Since commerce is very active and extensive in this State, there are several banking institutions that do extensive business. Such firms are: Benito Palacios, Carlos Noe Cazares, B. Zorilla Sucres, in Ciudad Victoria; Sada Paz Hnos., in

Nuevo Laredo; The Tampico Banking Co., S. A., The Petroleum Banking and Trust Co., Heynen & Eversbusch, Compania de Bienes Raices, S. A., Brito & Hnos., Banco Nacional de Mexico, in Tampico, which is the most important place in the State. There is probably more room in this State for similar institutions.

TLAXCALA

Export.—Tlaxcala exports a large part of its products. Of the 125,000 tons of "pulque" produced here, 100,000 tons are shipped to Pachuca and Mexico, Federal District. It exports nearly 15,000 tons of corn, 5,400 tons of potatoes, 560 tons of chickling vetch, 23,000 tons of barley, 1,800 tons of beans, 800 tons of rye, 4,000 tons of sacred fir, 4,000 tons of pine, 2,000 tons of "ahuehuete," 1,000 tons of "aile," 130,000 tons of evergreen oak, 167,000 tons of torchpine. It exports a large quantity of the articles produced by the large factories within its boundaries, and more than 1,500 tons of the root of the "zacaton" plant (*epicampes macroura*) which is much used for the manufacture of coarse brooms for floor-sweeping in particular. From Apizaco, also a certain quantity of basket ware made of twigs of willow or osier (*phylopsis saligna*) and of river tamarisk (*salix taxifolia*) is shipped. From these plants the inhabitants obtain a very fine slip, which is very flexible when green, and from which they make hand baskets and work baskets, work tables, etc. Large quantities of flexible canes are made here for sale in various markets as walking canes.

All such articles might be exported in far larger quantities, as there is a demand for them; to do

this, however, it would be necessary to give better attention to agriculture.

Import.—Tlaxcala, in its turn, imports an infinite number of manufactured products, such as furniture, glassware, wearing apparel, machinery, etc., etc. These all come into the State from the City of Mexico, although, as is the case in some instances, the articles originally come from abroad.

Banking.—Banking operations are only carried on in the town of Apizaco; the firm of Claudio Herrera Ruiz represents the Banque Francaise du Mexique.

VERACRUZ

Export.—Veracruz exports large quantities of its products to foreign countries. The article of greatest demand abroad is, of course, petroleum, coming from the different oil fields, which leaves the port of Tuxpan and other shipping places reached by the oleoducts, such as Agua Dulce, Tamiahua, Mata Redonda, Puerto Lobos and others. Veracruz ships at least two-thirds of all the oil exported from Mexico. On the average from 180,000,000 to 200,000,000 barrels of this product are exported every year.

The State of Veracruz, furthermore, exports some 20,000 tons of sugar, more than 450,000 tons of sugar-cane, some 18,000 tons of "panocha" or brown sugar, more than 24,000 tons of molasses (of which it makes about 35,000 tons), 2,300 tons of coffee, 30,000 tons of rum, 7,000 tons of tobacco, 200 tons of vanilla, large quantities of fruit, especially bananas, of which it exports more than 11,000 tons; precious timber, metals, live stock, especially to Havana, cotton goods, cashmeres, articles made

of jute, large quantities of beer, made in the City of Orizaba which has the largest brewery in the country; many species of fish, shrimps, etc.

The export trade in this State is fairly high; the necessary elements to develop it are there; especially do the transportation facilities, at reasonably low prices to the port of Veracruz, contribute a great deal towards an eventual increase of this trade which will come as soon as there is a further development of the many industries established in the State. The exportation of timber could easily be increased by utilizing to a larger extent the various rivers for the haulage of the lumber. This has not been done thus far.

The oil and the timber go to foreign markets, as does also a considerable portion of the fruit; the tobacco, sugar-cane, sugar, rum, brown sugar, molasses, cashmeres, beer, fabrics and the other articles, except most of the cattle, which is shipped to Havana, go to different markets in the interior of the Republic.

Import.—The State of Veracruz imports little in comparison with what it exports; it brings in large quantities of books, paper and stationery, high grade furniture, fine silks, French and English cashmeres, all kinds of machinery, especially such as is used in the oil industry, considerable quantities of agricultural implements. Some of this class of merchandise comes from Germany, but most of it from the United States. Other articles included in the import trade are: hardware, notions, cutlery, crockery, wearing apparel and a number of other articles. The paper that is brought in comes from the paper mills of the Federal District; the school books are furnished by the publishing firms of Mexico City;

the jute utilized in the factories of the State comes from Calcutta. Other articles come either from foreign countries or from different sections of the Republic of Mexico.

Banking.—The banking business is in the hands of the following firms: Manuel A. Marengo, in the City of Cordoba; Ricardo Gomez, Sucres., in the town of Gutierrez Zamora, Justo Fernandez, Olivier, Hnos. & Co., Sanchez Rebolledo Hnos., in the town of Jalapa; Juan C. Gutierrez, in Orizaba; Jose Gonzalez Toate, in Perrote; Ismael Pavon e Hijos, Manuel Candanedo, in the port of Puerto Mexico; Banco Germanico de la America del Sur, Banque Francaise du Mexique, Banco Nacional de Mexico, in Tuxpan; Julian & Sob, Banco Mercantil de Veracruz, Banco Nacional de Mexico, Banque Francaise du Mexique, Comision Monetaria, Eulalio Roman, Viya Hnos., Sucres., Zaldo Hnos. & Co., in the port and City of Veracruz.

YUCATAN

Export.—The principal and practically the only article exported from this State is the sisal fiber. The average yearly output for exportation is given in the chapter on Agriculture; nearly all goes to the United States, where it is used in the manufacture of twine. A more extensive cultivation and the extension of the market of this fiber would be extremely useful to all parties concerned, since the diversity of the markets would probably cause this class of fiber to be of use also in other industries, thus creating a larger demand for it. Other articles exported from the State are salt, sold to other States of the Republic, and some rubber, "chicle"

or sapodilla-gum, and timber; these articles go to the American market.

Import.—The articles imported into the State comprise: sugar, rice, coffee, cocoa, oats, bran, soaps, beer and liquors, lard, drugs, wearing apparel, cloth, cashmeres, silks, furniture, notions, cutlery, crockery, hardware, machinery and tools of several kinds, musical instruments, books, paper, stationery, and a number of other articles. Beans and corn are also brought in from other parts of Mexico, whenever these are not harvested in sufficient quantities in the State itself.

Some of the articles named come from other parts of Mexico, a large amount of them from the United States, some machinery, electrical implements, toys and a few other articles from Germany, perfumes and drugs from France, cloth, cashmeres and other fabrics from England, and hats from Italy.

Banking.—There are several banking institutions established in the Capital of the State; these are: Alberto Montes, S. en C.; La Comision Compradora de Henequen, Arturo Pierce, Arturo Price, Banque Francaise du Mexique, La Monetaria. The business transactions of these firms comprise those of banking institutions in general.

ZACATECAS

Export.—The State of Zacatecas exports the silver, gold, copper, antimony, mercury, lead and zinc produced in its mines; these metals are taken in the form of concentrated ores to the foundries of Aguascalientes.

The State, furthermore, exports large quantities of "zarapes" (blanket cloth), "rebozos," a kind of

shawl, the by-products of the milk industry, live stock for the meat market, untanned hides, some corn which goes mostly to the State of Coahuila.

The export trade of the State could easily be enlarged, especially in articles manufactured from sugar-cane, by increasing the production of cane and by adopting modern methods and machinery in the industry.

Import.—The State has to import most of the things it needs, such as different kinds of machinery, agricultural implements, notions, hardware, cloth, cashmeres, mostly from Mexican factories and a very small proportion from abroad. Much machinery is needed and imported for the mining industry. It imports large quantities of dynamite from a concern that makes this article in the State of Durango. Zacatecas must also bring in from other parts of Mexico considerable quantities of corn, beans and other cereals, of which the State does not produce enough to supply the local demand.

The export trade as well as the import trade will certainly increase as soon as the mining industry and the raising of live stock shall have recovered their former flourishing conditions.

Banking.—There are scarcely any banking facilities in this State, as a rule some of the merchants established in the State act as representatives of banks in the City of Mexico.

CHAPTER VI

MANUFACTURING INDUSTRIES

The industries of the natives which were very important before the Spanish Conquest, have lost much of their economic value, of course, as a consequence of the introduction of mechanical devices. Nevertheless, some of them are still quite extensive, as, for instance, pottery, mat-weaving, hat and basket-making from fibers, the saddle and leather industries, hand weavings, etc. The goods manufactured in their primitive way by the Indians are often of excellent quality, adapted to the conditions of the country and of a pleasant and artistic appearance. The Indians used to do wonders in ceramics.

Although the Government of Mexico endeavors to promote the national industrial activities by means of protective tariffs and other special legislative measures, the development of factories along modern lines and machinery has not progressed very much, with the exception of the mining industry and its allied branches. In this regard Mexico still offers a multitude of splendid chances for men of enterprise and sufficient capital. Industry is most developed in the regions of the Central Plateau, not to speak, of course, of the petroleum industry in the States of Tamaulipas and Veracruz.

Certain raw products, such as different species of fiber, sugar-cane, etc., are prepared and made ready

for the market in industrial establishments in various sections of the country.

Industrial establishments of the greatest importance for the entire country are undoubtedly those for the production and transmission of electrical energy, some of which are simply grandiose. They make the existence and further establishing of industries possible, since coal has up to now not been greatly exploited and is still quite expensive.

Weaving mills and spinneries occupy first place among the factories established in Mexico; they are mostly in the hands of Spaniards and Frenchmen. These factories are organized on entirely modern lines, equipped with the best kinds of machinery, mostly of English make, and manufacture all kinds of fabrics, especially cheap ones, such as percales, calico, muslins, coarse cotton cloth, etc.

There has been no increase in the number of such mills for a number of years.

The manufacture of woolen cloth was started during the world war. The factories spin their own yarns and produce a very acceptable cloth.

There are several foundries, machine factories and allied works in the country which were greatly developed during the last world war. Many machines which in the past had to be imported are now manufactured in the country.

Sawmills are being established in increasing numbers, in order to exploit the timber wealth of the country, instead of buying lumber abroad at very high prices.

There are many tanneries all over the country; the leather they produce is, on the whole, very good and durable.

Quite a number of shoe factories produce, in

our opinion, excellent goods. Large quantities of shoes are imported, nevertheless, from the United States.

The saddle-making industry (the trees as well as the leather and metal parts) and the leather industry are highly developed. The making of Mexican saddle-trees is an industry by itself.

The hat-making industry makes especially the gaudy large type of hat, generally known under the name of Mexican hat or "charro" hat.

The cigar and cigarette-making industry comprises a large number of factories, some of them very large, indeed; all told there are about 450 such factories in the country, using about 9,000,000 kilos of tobacco.

Four large and a small number of less important breweries make on the average every year some 500,000 hectoliters of beer.

The sugar industry may be called flourishing; sugar mills are scattered all over the country. In most cases rum distilleries are combined with the sugar mills.

There are not many vegetable-oil mills in the country, probably because the production of oil-yielding fruits and seeds is not sufficiently developed.

There are a number of paper mills established in Mexico which, using raw material from the Mexican territory to the extent of over 80 per cent of the total employed, produce over 90 per cent of the different kinds and grades of paper consumed in the country.

A number of industries established in most of the towns of the Republic are small in size and in importance for the time being, but pointing in many instances the way to a better utilization of

existing raw materials and a more modern development of new industrial undertakings along scientific lines.

In the following pages more details are given concerning industrial activities in the various States, and the opportunities they offer for the investment of capital.

AGUASCALIENTES

There is quite a large number of industrial undertakings in this State, among them some 11 spinning and weaving mills making cotton goods, 6 cigarette factories, 1 producing starch, 18 manufacturing earthenware, 2 match factories, 6 brickyards, 3 noodle factories, 50 flour mills, 1 furniture factory, and 2 mineral water works. In the City of Aguascalientes are located the best and most important machine shops of the Mexican National Railroads, in which not only the rolling stock and the locomotives are repaired, but also railroad cars, in no respect inferior to those imported from abroad, are made. Aguascalientes has also a large foundry which gives employment to about 2,000 people; the railway workshops employ more than 4,000 persons. In all the other factories established in the State are employed about 7,000 persons.

The spinning and weaving mills utilize the cotton from the Laguna section, and manufacture cheap cashmeres, cambrics, shawls, cheap blanket cloth, cloth, coarse white and colored cotton cloth. Many women are employed in the making of fine needlework and embroidery, highly esteemed by the public; these goods are always offered to the passengers on the trains at the railroad station of Aguascalientes and represent in many instances real art work. Most

of the flour turned out by the mills of Aguascalientes is exported to other parts of the country; the wheat comes from the fields of this State.

Most of the manufactured goods are for the local market.

All the industries existing in the State could and should be enlarged, for there is a good market for the products in the State itself and in the southern section of the State of Zacatecas, parts of Jalisco and other places, an abundance of raw material nearby and good transportation facilities.

Electric power is used for operating the factories; it is generated in another State and furnished by the Street Car Company of the City of Aguascalientes.

The State produces plenty of barley, grapes and a good grade of tobacco; therefore the establishment of a beer brewery, and the making of wine and cigars could count upon good financial results. Then there is room for a good tannery for hides and skins, and for the establishment of shoe factories. Furthermore, there is probably a good field for foundry works. The foundry in Tepezala might be enlarged.

BAJA CALIFORNIA

There is scarcely any industrial activity in the Territory of Baja California. The people turn out small quantities of sugar and rum. Consequently the Territory is an untouched field for any kind of industry for which there is an abundance of raw material. Of course, in attempting to establish an industry a number of things have to be considered, but at any rate we think that persons with means, intelligence and energy should find it worth while to further investigate the matter.

CAMPECHE

Every plantation cultivating the sisal hemp is at the same time a fiber-extracting factory, so that there are as many factories of this kind as there are plantations. The Capital of the State has a few small factories that turn the sisal fiber into robes, cords, sacking and a few other articles which are exported to different parts of the Republic. There are also a few factories making soap, candles and noodles. Campeche, the Capital of the State, has an ice factory and an electric light and power plant.

Charcoal is the fuel used by all these factories, being the cheapest that can be had. The utilization of tortoise-shell in the manufacture of a number of beautiful articles is an industry peculiar to this State. Combs, ear-rings, finger rings, fan-chains, jewel boxes, walking canes and a number of other articles are made from this material. This interesting industry could be considerably enlarged, more capital and energy being necessary. Any quantity of the needed raw material is near at hand. Fine straw hats are made from the fiber of a special palm-tree that grows abundantly in the section of the little town of Becar; these hats compare very favorably with the best panama hats and cost less. Although all the people of this town know how to make such hats, the regular output is not large enough to do an export business of any importance with the United States, for instance. In this case again, more capital and energy or spirit of enterprise are needed, to attain profitable results.

The bay of Campeche being extremely rich in algological flora, it has been noted for its abundance and great variety of fish, all of exquisite taste.

The establishment of a regular plant for preserving and salting fish would certainly yield the best financial results; even now the quantity of fish exported to the State of Yucatan is considerable. Capital, however, is needed to turn the fisheries of Campeche into a profitable business.

CHIAPAS

Chiapas is not much of an industrial State, although it has exceptional facilities for being so. There are the following factories, none of them of great importance: a few cigar and cigarette factories, a foundry, and mechanical workshops, some mineral water works, candle factories, brick works, alcohol distilleries, several small concerns making hats of palm leaf, molasses, sugar, rum, or cordage.

Very little of these products leave the State, owing to the small quantity made and lack of necessary machinery.

Although we have repeatedly mentioned it, we cannot refrain from insisting once more upon the fact that Chiapas has unexcelled facilities for becoming an industrial center of the first order, since it enjoys such exceptional natural advantages.

None of the manufactured products leave the State; they are not even sufficient to supply the needs of the people.

The number of persons employed in the different industries is really insignificant.

No use whatever is made of the power which could be utilized from its rivers which flow into the Pacific. Although the existing waterfalls are of no great size, they would be sufficient to produce electric power for electric light, tramways and factories;

such power could even be furnished to all the towns of the State and to those of Tabasco, Campeche and Yucatan, if points were chosen on the Guatemala side, where the mountains of the sierras of Chiapas are highest and have some considerable falls.

The industries now existing in the State could be enlarged and new ones established. The results would be immediate and magnificent. Capital and workers are all that is needed. The raw material is going to waste. For cotton spinning and weaving mills plenty of raw material is found throughout the State and particularly in the region of Simojovel, where the "pochote" or cotton-tree forms immense forests. Sisal hemp could be used in textile factories; the "guasima" plant would supply the material for rope works and other factories. The manufacturers of preserved and candied fruits would find an unlimited field for their activity.

CHIHUAHUA

Little industrial activity is found in the State of Chihuahua; it comprises some spinneries and weaving mills, mineral water works, soap works, flour mills, candy and chocolate factories, a few sugar mills, a number of very small concerns making saddles and saddle-trees, cheap blanket cloth, tanneries, potteries and a beer brewery.

The spinneries and weaving mills are rather important; they produce mostly cheap cotton goods and employ about 600 persons.

The existing industries are far from utilizing all the raw material produced in the State; most of this is exported to other sections of the country.

The spinneries, weaving mills, brewery and some

of the mineral water works use the electric power produced at the large basin of the Conchos river, the other industries are operated either with hydraulic power, as the sugar mills and the flour mills, or with animal power.

The number of workmen employed in all the industries of the State is about 3,000.

The following industries could be developed or introduced: enterprises that would exploit the different kinds of fiber growing in the State for the making of cordage and similar products; in the sierras and in the plains there is an abundance of "lechuguilla" (*agave heteracantha*), maguey (*agave* sp.) and the "zapupe" (*agave derveyana*) which could be easily cultivated in the irrigated deep valleys; furthermore, good tanneries and various leather industries could be established; soap works, since there is in the fields of Chihuahua an abundance of "chicalote" (*argemone mexicana*) and the "cadillo" (*xanthium canadense*); the "candelilla" (*euphorbia antisiphilitica*) should be utilized for the production of wax; palm hats can be manufactured from the various species of palm-tree leaves abundant in the State.

COAHUILA

There are few factories in this State: several spinning and weaving mills, one large and two small foundries, soap works and oil mills, flour mills and wine-making concerns.

The large foundry is located in Torreon and the other two in Saltillo, being branch plants of the large iron and steel works of Monterrey.

The spinning and weaving mills manufacture

woolen and cotton goods; the raw materials they use are products of the State itself. The soap works and oil mills utilize the cotton seed. The bran-like residue of the cotton seed is turned into cakes called in the country "cascarilla" and is fed to the live stock, especially the cattle. The flour is made from the wheat produced in the State.

The markets for the products manufactured are, first, the State itself; part of the flour goes to the cities of Monterrey and Tampico, the vegetable oils and the soaps to different parts of the Republic. The wines and cognacs produced in Parral and Cuatro Cienegas are sold in the country and even abroad; they are considered as being of very good quality.

Some of the industries named use electric power which is very expensive in the State due to the system of generating it; other industries use hydraulic power.

About 6,000 workmen are engaged in the different industries operating in the State, that is: 4 foundries, 44 distilleries, 20 sugar mills, 3 ice plants, 55 flour mills, 23 spinning and weaving mills, 2 soap works, 5 noodle factories and a few other concerns.

Industries that could be introduced and developed in the State are: factories for the manufacturing of rubber articles, such as tires, etc., utilizing the "guayule," a rubber-yielding shrub which abounds in the State; wax factories, exploiting the wax-containing plant, known under the name of "candelilla" (*euphorbia antisiphilitica*); and powder factories, since there is in the State an abundance of a plant called "gobernadora" (*larrea mexicana*) which contains explosive substances.

COLIMA

Most of the few factories that exist in the State are located in the town of Colima. There are two spinning and weaving mills which turn out low grade products, several mineral water works, starch works, sugar mills, wax match factories, cigar and cigarette factories, soap works, brick works, noodle and candle factories. The making of palm-leaf hats is engaged in by a number of persons as a side-line, in addition to their ordinary occupations, as is also the case with this same industry in the States of Oaxaca, Guerrero, Campeche and Chiapas.

About 7,000 people are occupied in all these different industries.

The manufactured articles, with the exception of the products from the sugar mills which leave the State, are absorbed by the local market.

The spinning and weaving mills utilize the electrical energy generated on the Armeria river.

There is plenty of raw material in the State for the further development of such industries as are already functioning and for the establishment of new ones; fruit and fish preserving plants would do well; textile industries should be developed for the exploitation of several kinds of fiber, such as "ixtle." Paper mills and breweries could also be established. As already stated, there is plenty of raw material near at hand and a ready market for the products, nor is there any difficulty in getting workmen.

DISTRITO FEDERAL

Many factories are actively working in the City of Mexico and in other places of the Federal Dis-

trict, due to its facilities to dispose of all kinds of products. Some 250 factories are being operated within the small territory of the District; 25 of these are spinning and weaving mills, 23 cigarette factories, 8 manufacturing wax matches, 7 candle works, 20 candy factories, 19 tanneries, 8 flour mills, and a number of others making mineral waters, beer, mirrors, ice, vegetable oils, soaps, perfumes, paints, steel wire, glass, pianos, noodles, paper, cement, furniture, chocolate, shoes, leather goods and other articles.

About 23,000 hands, men, women and children, are occupied in these factories.

The raw material consumed by these factories comes either from other sections of the Republic or to a small extent from the Federal District itself, as the raw silk for example.

All the goods produced in these factories are sold in Mexico's own market.

The motive power used by the majority of factories is electricity generated by the "Compania Mexicana de Luz y Fuerza Motriz."

The Federal District offers many chances and advantages for the establishment of other factories utilizing the many varieties of raw material produced in the different regions of the Republic.

DURANGO

There are not many large factories in the State, these amounting to 72 in all, as follows: 20 rum distilleries, 3 mineral water works, one sugar mill, one stearine candle works, one wax match factory, 6 cigarette factories, 20 spinning and weaving mills, one soap works, one furniture factory, one noodle

factory, one powder factory, one shoe factory, 14 flour mills, one dynamite factory and a number of others. The dynamite factory not far from the town of Gomez Palacio manufactures dynamite and other explosives; it supplies dynamite to all the mines of the country and its products are much sought after on account of their excellent quality. The mills of the Brillante and various others of the *Campania Harinera de Durango* make flour of good quality, partly exported and partly consumed in the State.

The thread and cloth factories make cotton blankets, cashmeres and bedspreads, almost all of medium grade, and use cotton from the *Laguna* region and wool from the large farming estates of *Cuencame*, *Nombre de Dios*, *San Juan del Rio*, *Durango*, *Canatlan*, *Nazas* and *Santiago Papasquiaro*. The State of *Durango* is the principal user of these products, also various towns in other States.

All these towns would offer larger markets, if the raw material could be obtained at a lower price, for which it would be necessary to plant cotton on a larger scale and to give more attention to wool-producing stock. In most of the spinning and weaving mills hydraulic power is used, in others electric power which is very expensive.

About 5,000 workpeople are employed in all the manufacturing establishments of the State.

Various new industries could be established: the manufacture of cloth fabrics from the fiber of the "*lechuguilla*" (*agave heteracantha*) which is very plentiful and grows without cultivation; fruit preserving and canning would be a good business in this State, the extraction of vegetable wax from the "*candelilla*," the juice of which contains this prod-

uct, the manufacture of India-rubber products, plants for the manufacture of powder and other explosives, as the "gobernadora" plant (*larrea mexicana*) is plentiful in the State. Power plants, for the supply of electric energy should be established, especially on the Tunal river which could supply current and power to the City of Durango at a reasonable rate.

All the existing industries, if engaged in by enterprising men with sufficient capital, would have a big future. All new undertakings to further industrial development would bring real wealth to the State.

GUANAJUATO

This State leads all the other Mexican States in industrial undertakings. There are many factories, some of which are really efficient. Spinning and weaving mills for cotton and woolen goods, tanneries, candy factories, shoe factories, concerns making hats, mats, rugs, baskets, etc., provide employment to many of the inhabitants of this State.

The weaving and spinning mills manufacture cashmeres, cotton cloth, cheap blanket cloth, woolen blankets, various other fabrics, table covers, shawls, etc., which are justly famed.

The numerous spinning and weaving mills use raw material which is mostly obtained outside the State, especially the cotton. Part of the wool is produced in this State.

The products of most of the factories established in the State are exported to different sections of the Republic. There are, furthermore, a number of establishments making "cajetas" (boxes containing jellies), soda water works, one ice plant, several

cigarette factories, tanneries, candy and chocolate factories, candle works, mosaic works, sugar mills, liquor and wine factories, several concerns making paper boxes, wax matches, iron beds, flour mills, cigars and cigarettes, different kinds of noodles, neckties, saddle-trees, ice plants, shoemakers' lasts, soap factories, brickyards, tanneries, shoe factories, "tuna" cheese factories, cordage factories.

All these factories use preferably the raw materials produced in the State itself. The shoe factories get their material from the local tanneries, many of which have adopted modern methods. The saddle makers of the State, especially those of the City of Leon, produce very fine and costly articles.

Some of the articles manufactured in this State are sold all over the Republic; they are produced at low cost and have therefore a great advantage over similar foreign-made articles.

Almost all of these industries could be enlarged by the introduction of more modern methods and machinery.

The large spinning and weaving mills, the shoe factories, the soda water works and some of the flour mills are operated by electricity, the power being furnished by the Central Mexico Light and Power Co. to the entire State; this electric power is produced in the State of Michoacan.

About 12,000 workmen are employed in the large factories, while the total number of persons engaged in the numerous industrial works is not less than 70,000.

Among the new industries that could be started in this State we mention the beer-brewing, for which there is already a large production of barley, which could easily be further increased by a more energetic

application on the part of the farmers; glass could be manufactured, since there is plenty of the needed raw material. The growing of the white-mulberry tree (*morus latifolia*) and the rearing of the silkworm, for which the climate of this State is excellent, could be undertaken as well as the establishment of silk factories. Office furniture could also be manufactured in the State. There is, furthermore, plenty of room for more spinning and weaving mills; for this, of course, the farmers would have to be induced to plant and supply more cotton; but even under existing conditions new spinning and weaving mills would do well, since cotton and wool can be had not far from the industrial center of Guanajuato which at the same time possesses the best means for the distribution of the manufactured goods.

GUERRERO

This State is greatly handicapped in its industry by the lack of means of transportation which makes the sending out of the manufactured goods as well as the raw material produced in this region a matter of great difficulty. There are, nevertheless, a few spinning and weaving mills, some vegetable oil mills, soda water works, soap factories, liquor distilleries, sugar mills which also turn out brown or unrefined sugar and cane rum. Many persons in the State are engaged in the making of palm hats, which is rather a home industry and conducted on a small scale, utilizing for the purpose the raw material of which there is plenty in this region.

The products of the spinning and weaving mills are not sufficient to cover the local demand; the

other products, with the exception of sugar and molasses, are also consumed in the State.

The factories in the port of Acapulco use electric power, and those in Chilapa are operated by hydraulic power.

The number of persons occupied in the different industries is about 2,000.

The State produces large quantities of different raw materials which could be turned to account by establishing new industries, but, as already stated, the question of means of communication is a serious one and must be solved first in order to fully exploit the natural resources of the State.

HIDALGO

Industry is another field in which the State could turn to better advantage its splendid location with reference to the Capital. It has no large factories. It has about 203 rum distilleries, 4 starch factories, 5 candle factories, a very important Portland cement plant, 19 spinning and weaving mills, 7 flour mills, and a few other concerns, such as "pulque" fermenting plants. Ore-treating plants are located in Pachuca, Real del Monte, Zimapan and in other places.

The weaving and spinning mills use cotton which almost all comes from the Lagoon district and very little from the Huasteca section belonging to the State of Hidalgo. A portion of the sheets, cloth, cashmere and other cloth fabrics which they make are used at home, and the balance is sent out to the City of Mexico, whence it goes to other towns of the country. The cement factory uses the raw material supplied by the soil of Hidalgo itself; the mills make flour from the wheat grown in the State, and the

manufactories of rum, candles, soaps, cigarettes, and matches, all use material derived from the interior of the State. Only a very small quantity of these manufactured products leave the State, as nearly all of them are consumed in the domestic market.

The development of the market for the articles produced in Hidalgo depends upon larger production and upon additional capital to be invested by men interested in new industries, either similar to those existing or of a different nature.

Although the Pachuca power plant, which is dependent upon that of Necaxa, furnishes power to some of the factories, not a few use water-power derived from the Tula and Moctezuma rivers. The factories in the State are in general so small that, all in all (there are about 800 factories), they employ 3,500 people.

Among the industries that could be developed in the State we should mention: the spinning and weaving of the "ixtle" fiber, as ixtle abounds in the State; the preserving of fruit, as very little use is at present made of the products from the Huasteca in this respect, owing to the lack of means of transportation; oil-pressing plants, for the utilization of numberless oil-producing plants, such as "chicalote" (*argemone platyceras*), peanuts, at present only used as a fruit, and others; soap factories, essential oil distilleries; perfume factories; tanneries, as there are many trees with bark suitable for tanning skins; shoe factories, and many others. They would all have a sure home market.

JALISCO

Although at present the industrial activities of this State rank among the first, they would still be

more numerous and important, if transportation facilities were better distributed over the different sections. The State has several weaving and spinning mills, making woolen, cotton and silk fabrics, rope-making factories, tanneries, "tequila" and other liquor distilleries, soda water works, soap works, oil mills, starch factories, brickyards, cart and carriage factories, machine shops, foundries, candy and chocolate factories, stearine candle factories, noodle factories, fruit preserving plants, sugar mills, oil of turpentine mills, flour mills, factories making shoes, saddles, leather goods, furniture, paper, glass, fine crockery, earthenware, mattresses, bed covers, ice, perfumes, cigars, cigarettes and wax matches, and flour mills.

The cotton used by the mills in this State comes partly from Jalisco and partly from the States of Colima, Michoacan, Durango and Coahuila. The soap works obtain their oil and fats, etc., in the State; the maguey plant furnishes the material for the manufacturing of the beverage known as "tequila" (the preferred species of maguey is the "agave asperuna"); the best "pulque" brandies are manufactured in the town of Tequila, whence the name of the special brand of pulque brandy. The potteries make use of the clay found in the State, the most famous being that of Tlaquepaque, a suburb of the City of Guadalajara.

A considerable portion of the goods produced in the spinning and weaving mills is consumed in the State, the rest being exported to the States of Aguascalientes, Zacatecas, Nayarit, Colima, Sinaloa and Michoacan, these being also the markets for the other manufactured articles. The crockeries and the "tequilas" are in great demand all over the Republic.

All the goods manufactured in this State are in constant demand, so much so that it would be an easy matter to find a market for goods manufactured by new factories.

Many of the factories utilize the electric power generated by the electric plant of Juanacatlan. Others make use of hydraulic power, and others use animal power.

More than 12,000 people are employed in the different factories, not counting the persons that work at home.

There is no reason why the existing industries should not be increased, and since the State is a great source of raw materials of different kinds, a number of new industries, such as factories for the making of high grade furniture, glass, rubber goods, ebonite, etc., could be established.

MEXICO

In the industrial field the State of Mexico profits much by its proximity to the City of Mexico and by its splendid means of transportation. The State of Mexico has, all in all, about 170 factories, which employ not less than 7,000 people. Among the industrial establishments the following deserve mention: 25 spinning mills, one brewery, 27 sugar mills, 15 liquor distilleries, 7 oil refineries, 5 cigarette factories, 11 soap factories, 2 paper mills, 39 flour mills, 7 wine distilleries, 3 glass factories, 19 brick-yards.

All the factories mentioned have plenty to do; the spinning and weaving mills turn out cashmeres, cloth, cotton goods, shawls, braided and woolen blankets, kerchiefs, and different woolen goods, etc.

One factory turns out jute products, employing more than 300 workmen; other concerns prepare canned meats.

Almost all the goods manufactured in the State go to the City of Mexico, where they are either consumed or sent to other parts of the Republic. Various houses produce bast covers for the protection of bottles; there is a great demand for this article, large quantities of which can be produced from the "tule" plant (two species: *thipha angustifolia* and *ascyrpus lacustris*) which grows in abundance on the lakes of the State of Mexico. Baskets of good quality are likewise made from common reed grass (*arundo donex*) which grows abundantly on the lake shores of the State.

All the important industrial establishments use electric power which they get from the power plant located in Necaxa.

More enterprising people are needed to increase the manufacturing capacity of the State, and to take advantage of the large quantities of raw material that are there. The State has industries which are insufficiently developed, being run on a primitive and inefficient basis, as for example, the basket and the bast covers (for bottles) industries. The proximity of a sure market and the transportation facilities should also encourage the growth of industry in this State.

MICHOACAN

Although there are nearly 300 factories in the State, they are nearly all of but small importance, this being shown by the fact that, among them all, they give employment only to about 6,500 people.

The total of the existing factories is distributed

as follows: spinning and weaving mills, 16; flour mills, 74; wheat mills, 85 (the other plants mill not only wheat but also other grains, while the last named mill nothing but wheat); rum distilleries, 34; oil mills, 4; cigarette factories, 45; starch mills, 1; beer breweries, 3; soap works, 33; brickyards, 21; potteries and various tanneries, 16.

The spinning and weaving mills use cotton, wool, and flax which are produced within the State; the wheat comes from Michoacan farms; the cigarette factories use tobacco grown within the State; the factory known as the "empacadora de Carnes en Conserva" (the Meat Packing Co.), packs the meat derived from local herds; the sugar mills grind the cane of local plantations, similarly all the other industries depend upon local products.

The manufactured thread and cloth are mostly consumed in the State; sugar and flour are shipped to the Capital of the Republic and to other markets throughout the country.

Water-power is generally used to operate the present factories and mills; in some few cases electric power, derived from some waterfall is used.

The industries that might be established are: silk spinning and weaving mills, if the white-mulberry tree were cultivated more extensively; cotton mills, by increasing the cultivation of cotton. Speaking generally, every kind of industry could be carried on in the State of Michoacan, and present manufactories developed. To do this it is necessary to solve the problem of transportation.

We must also mention the oil-crushing industries and those connected with them, such as soap-making, which have a great future here, as the olive and sesame plant are abundant in the State, and also

because cotton could be grown on a large scale, the seeds of the latter containing a large quantity of oil. The great advantage of these industries lies principally in the abundance and low cost of the raw material.

MORELOS

It is a pity that industrial activity should have attracted so little attention on the part of the inhabitants of this State, while in other parts of the Republic it is so energetically pursued. There is only one weaving mill making shawls, a large number of soda water works, due to the circumstance that a very hot temperature prevails all over the State; also two soap factories, one cordage factory, one brickyard and one liquor distillery.

These data show that there is practically no industrial activity in this State. This state of affairs is not justified, and different industries should be established, making use of the many raw materials produced in the State which are now exported, instead of being utilized in the form of manufactured goods, providing employment to a number of people and at the same time resulting much cheaper.

At present scarcely 300 persons are occupied industrially.

Since there is an abundance of textile raw material in the State, several industries could be established on the basis of these materials; conditions are also favorable for paper mills, palm hat manufactories, etc. Furthermore, since large quantities of sugar-cane are sent out of the State, it should be more profitable to establish some kind of industry that would exploit such cane for the greater economic benefit of the State.

NAYARIT

Industrial conditions in this State should be far better, in view of the abundance of raw material. The few weaving and spinning mills manufacture cheap blanket cloth, bed covers, cheap cotton goods, muslins, percales, and similar fabrics. But these factories produce little and low grade products at that, which are not even sufficient to meet the local demand. There are also several soap works, oil mills, cigarette factories, soda water works, candy and chocolate factories, candle works, liquor distilleries and sugar mills. These factories use either hydraulic or animal motor power, not employing over 300 persons, not counting, of course, those engaged in the making of palm hats at their homes.

These data clearly indicate that industry in the real sense of the word still remains to be established in this State.

Rope-making and similar industries could be engaged in, since there is in the State an abundance of the proper kind of fibers, such as "guapilla" (*agave falcata*), "clavellina" (*pachira*), "guasima" (*guazuma polibotrya*), "guamara" (*bromelia pinguin*), and another species of "clavellina" (*bombax palmeri*) which is excellent as a filling for pillows and mattresses; "majagua" (*hibiscus tilicens*) and "tecmaxochitl" (*cachlospermum hibiscoides*) could be used for the same purpose. There is also plenty of raw material for the oil-milling industry.

Many other industries can be established in this State as soon as rapid communication is established between San Blas and Guadalajara, Mazatlan and Durango, and with the State of Zacatecas and the northern section of the Central Plateau.

NUEVO LEON

In the industrial branch the State of Nuevo Leon bids fair to become a leader among other Mexican States. Many of its enterprises are really tremendous, as the iron and steel foundry of Monterrey for example, which is the largest of its kind in the country; it utilizes metal from all over Mexico and gives employment to more than 5,000 people; its products are excellent and consequently in great demand. The Cuauhtemoc beer brewery is another of the prosperous industries in the State, employing several hundred persons. The two concerns just named utilize raw material which comes from outside of the State. The foundry gets its iron ore from the Mercado mountain in the State of Durango which is said to contain the largest iron ore deposits in the world; this ore is easily worked not only in the form of limonite and hematite which give about 60 per cent of metal, but also in the form of goethite and magnetite, which are of a high grade, although requiring a longer process. This foundry provides the Mexican railroads with rails and other material. The brewery uses raw material from different sections of the country and from abroad.

The other industries of the State comprise cart and carriage makers, ice plants, furniture factories, starch mills, cordage makers, flour and oil mills, mineral water works, paper box manufactures, iron bed factories, cigar and cigarette factories, plants for chemical products, candies and chewing gum factories, broom factories, soda biscuit factories, soda water works, flour mills, weaving and spinning mills, brickyards, furniture factories and noodle factories. The weaving and spinning mills make

percales, muslins, gingham, bed sheeting, towel cloth, blankets, cotton cloth, shawls, and a great many similar goods.

The articles manufactured in the State go mostly to the different Mexican markets and partly even to the bordering American region.

Most of the large factories use electricity for motive power. The number of workmen passes 40,000.

The silk-weaving industry could be introduced as one of the new industries that would prosper in the State; for this purpose the production of the white-mulberry tree and of the "*bombix mori*" would be necessary. Flax should also be cultivated in sufficient quantities in order to run linen factories. Paper mills, glass and porcelain factories could easily be established in Nuevo Leon.

General conditions in this State, especially with regard to geographical location and traffic facilities, make it especially suitable for the establishment of the various kinds of industries.

OAXACA

This is not a manufacturing State, although it might easily become one, at least to the point of meeting its own domestic requirements. Within its boundaries raw material is produced in very large quantities, such as "pochote" (cotton-tree), cotton, "ixtle" fiber, sisal hemp, etc., all of which could support large spinning and weaving mills. All over the State the inhabitants make hats of palm leaves (*brahea dulcis*), from which they make also hammocks and other articles; the "pita" (*ananas macrodentes*) is among the most famous fibers

in the country and in Oaxaca it is principally used for making packthread for sewing leather goods and for embroidering riding saddles. There are several brick factories in the State, mineral water factories, breweries, liquor distilleries, alcohol distilleries, flour mills, soap works in various parts, tanning yards, iron and copper smelting works, candle works, noodle factories and candy factories. This list shows how far behind the State of Oaxaca is in the matter of industrial establishments, being surpassed by many States which have to import all their raw material, or at least a large part of them, as is the case with the Federal District, the States of Puebla, Mexico and Guanajuato, etc. Oaxaca would have but to use its own products. The factories mentioned are distributed over several sections and towns of the State.

No manufactured goods are, as a rule, exported from the State, except large quantities of hats and blankets which go to a number of markets in the interior of the country.

Present manufacturing industries in their various branches, as well as a number of new ones, could be undertaken upon a very large scale in the certainty that all their products would find a ready market in the State and outside of it.

The factories now working do not use much mechanical motive power. The looms for making blankets are old-fashioned and hand-operated. In hats, each one has its own special pattern of weaving. The hat-making industry is not a steady one, as people devote to it only their spare time or the days when they are not compelled to work at other occupations. The same thing may be said of the blank-

ets, as they only make them at certain times. There are very few weavers who work continuously. The tanning industry is one of the specialties of the State and should be encouraged, while scientific methods such as are used abroad should be adopted, and in this way Oaxaca's output would soon rival the best grades of leather products, since it has all the necessary natural resources.

The manufacturing industries which might be established and would be welcomed by the inhabitants of Oaxaca are: spinning and weaving mills for the utilization of the products of the different fiber-producing plants; oil-crushing mills for making castor oil, an industry which at present is only in its infancy; olive oil, sesame-seed oil "azafrancillo" oil (from the "carthamus tinctorius"), etc., there being immense quantities of raw materials which up to the present have not been utilized; factories for the manufacture of hats from the "palma jipi" (*carludovica palmata*), turning to account the natural aptitude which the inhabitants of the State have for this industry, etc.

The manufacture of paper, glass products and earthenware could be carried on extensively, by which means this State could be made commercially independent of the others, and at the same time assume an important place in industry, for which it is naturally well fitted.

Present industries could be encouraged and developed, there being some, such as the manufacture of glycerine, which has already been started very successfully in Oaxaca, where there is also a small factory for cotton thread and cloth. Means of transportation and enterprising men are very much wanted at present.

PUEBLA

Puebla ranks fourth among the Mexican industrial States and has a great future ahead of it, for the people are considerably inclined towards industrial enterprises. The following factories are operating in this State: more than 50 weaving and spinning mills which produce excellent cloth and cashmeres and various other fabrics; these are readily accepted on the market and compare very favorably with similar foreign-made goods; the factories get their cotton from Laguna, Tamaulipas, Michoacan and other sections of the country, and the wool from various States of the Republic. There are also alcohol and rum distilleries, soda water works, flour mills, and other industrial concerns.

More than 20,000 people are at present at work in the different factories which use electric energy for motive power, generated by the great electric plant of Necaxa.

Many other factories can be established in this State, for there is all the raw material that can be desired and plenty of electric power. In fact, more electric plants could be built by utilizing the large waterfalls of several of its rivers.

New factories that could be established are the following: mills and factories exploiting the different kinds of fiber that obtain in this and in other States; factories for the extracting of vegetable wax from the "candelilla" (*euphorbia antisiphilitica*) and another plant known in the country under the name of "copalxihuitl" (*myrica xalapensis*) which abound in the forests of Puebla and contain a great deal of splendid wax. Oil mills could also be established for the purpose of exploiting the "azafran-

cillo" (*escobea linearis*), sesame seeds, peanuts, castor-oil seeds, "chicalote" (*argemone mexicana*) and many other seeds which grow spontaneously in the fields and forests of Puebla. Another useful plant which abounds is the "linaloe" (*burselia oleoxylon*).

Either more of the kind of factories that already are being operated or new industrial enterprises might be worked in the State with every prospect of success.

QUERETARO

The State is not as much advanced as others in the matter of industry, but there are some important factories; some spinning and weaving mills making cotton, woolen and silk goods; these get their raw material from different sections of the country, the manufactured goods being sold partly in the State and partly in other parts of Mexico. Other factories comprise rum distilleries, soap works, soda water works, ice plants, noodle factories, flour mills, candle works.

All these factories are of small importance and probably do not even supply the local demand.

Industrial activities should be greatly increased in this State, on account of the cheapness of the raw material and labor, and the facilities of getting a ready market for all the production.

Electricity is generally used in the weaving and spinning mills, and hydraulic power in the flour mills.

Many new industries could be established, such as the making of cordage and similar articles, for which there is plenty of raw material in the State. Vegetable wax should be extracted from the "cande-

lilla" shrub which for this purpose should be planted on a large scale. Glass factories would find in the State all the raw material they need; the same is true of starch factories. The existing industries should by all means be enlarged. Toys for children made of reed are also made in the State; this industry should be enlarged and reed furniture made from the same material. High grade crockery could also be manufactured in this State.

QUINTANA ROO

From what we learn about the Territory of Quintana Roo in the preceding chapters, it is quite easy to conclude that scarcely any industrial undertaking could exist there; in fact there is none besides two sawmills; these are moved by steam and use wood as fuel. Some of the Indians apply themselves to the manufacturing of a few useful, though very primitive household articles, such as flat-bottomed washtrays and corn-grinding benches which they sell to the people of the State of Yucatan.

SAN LUIS POTOSI

Strictly speaking, it cannot be said that the State of San Luis Potosi is a manufacturing center to the same extent as other States of the Republic. Still there is a great future for industrial undertakings with excellent probabilities of success, especially as soon as means of communication all over the State and the production of electric power shall have been sufficiently developed. All in all there are about 224 manufacturing establishments in the State, viz.: more than 100 alcohol distilleries, 44 sugar mills, 5

match works, one brewery, 25 cigarette factories, 21 weaving and spinning mills, making cotton, wool and silk goods, 3 soap works, 8 brickyards, 2 furniture factories, 4 noodle factories, one metal foundry, 3 flour mills and other concerns of minor importance. There is also a factory that produces rope, cordage and articles made of "ixtle" fiber. "Tuna" paste is made on nearly all the plantations and farms located in the region where the tuna plant grows, especially in the center of the State. This product is sent all over Mexico. Alcohol distilleries are located principally in the vast regions where there is an abundance of "sotol," "lechuguilla" and "ma-guey," and on the sugar-cane growing estates.

The raw material used by all these different factories comes partly from this State and partly from other sections of the Republic.

A considerable quantity of the articles produced in the factories of the State are consumed in the State itself, the rest being sent away to other States.

A larger production, made possible by better facilities with regard to motive power, would greatly increase the export trade of the State of San Luis Potosi.

Electricity is used at present as motive power in most of the factories of the State; this is very expensive, since it comes from far away. Other factories use hydraulic power, especially in the Huasteca section. Motive power could be considerably cheapened by erecting electric power plants in the State which would be an easy matter. The greatest industrial concern in the State is the San Luis Foundry which employs not less than 800 men.

New industries could be established, especially in the textile field, in order to turn to better account

the fiber that obtains in the State, by modern methods and machinery.

The present manufacturing establishments may readily be increased, as the demand of the manufactured goods is greater than the supply.

SINALOA

Industry has been somewhat neglected in this State, where it should have been greatly developed, since there is plenty of raw material in the region. This is especially true in regard to the spinning and weaving industries, at present limited to one unimportant factory, since the necessary raw material is quite near at hand. The "ramie" fiber is also produced in the State, as well as the "guapilla," from which hose, neckties and similar articles can be manufactured.

Other factories in the State are the following: a number of "pulque" brandy distilleries, candle works, sugar mills, cigarette factories, furniture factories, soda water works, candy and chocolate factories, soap works, tanneries, rum distilleries (from cane juice).

None of these factories is of great importance. Most of the raw material is produced in the State itself.

Industrial activities can be greatly increased in the State, for there is plenty of raw material and the importation of all goods needed from outside causes these to be very expensive. The State should produce a great many of the articles it brings in from other sections of the country or from abroad.

The motive power used at present is either electric, hydraulic or animal.

All the factories now operated in the State do not employ more than 1,600 persons.

The weaving and spinning industry should be definitely established in the State; the cordage industry has here all the necessary prerequisites, such as "guapilla," various species of agaves, "ramie," hemp, "lechuguilla," flax, etc. The leather industry could also be easily developed, also factories for making paper, glassware, canned fruits, candies, canned fish, etc.

SONORA

The State of Sonora possesses all the resources necessary to engage in different industrial activities, somewhat neglected at present. It has several weaving and spinning mills, soda water works, soap factories, brickyards, tanneries, etc., which manufacture articles for the local market their quantity being small and of low grade. The most prosperous concern is probably the beer brewery located in the City of Hermosillo.

The principal factories operated in the State are the following: several spinning and weaving mills, flour mills, soda water works, brickyards, tanneries, cart manufactories, sugar mills, furniture factories, cigarette factories, soda cracker factories, candle works, and the large brewery already mentioned.

All these factories use raw material obtained in the State itself.

Most of the products of these factories are of the lower grade adapted to the needs of the masses and consequently consumed in the State. Small quantities of the beer are sent to the State of Sinaloa and the Territory of Baja California.

Electricity is used to some extent as motive power in the factories of Sonora, especially in Hermosillo, also hydraulic and animal power.

The number of workmen employed in the factories mentioned above does not exceed 2,000.

Many new industries could be started in Sonora: weaving and spinning mills could utilize hemp (*cannabis sativa*) which grows on the banks of the Yaqui river; flax (*linum usitatissimum*), a spontaneous product along the river Yaqui and in other regions of the State; at present only the seeds are exploited by the Indians for the making of oil; the precious fiber is thrown away; the "ramia," the cultivation of which was tried in 1891 with the best success; the sisal fiber which prospers in the dry sections of the central and eastern parts of the State could be cultivated in the northwestern portion of it; different species of the agaves (*agave* sp.) and other textile plants. Fruit preserving and canning factories could also be established; cordage factories could exploit the "lechuguilla" plant which grows plentifully in Sonora. Shoe factories should also be established, as well as other concerns that use a great deal of leather, along with modern tanneries that would prepare all kinds of hides and skins, large quantities of which can be had in the State. Cigar and cigarette factories would prosper. Years ago the white-mulberry tree was planted in the State and now grows well; it would be a profitable undertaking to extend the cultivation of this tree and that of the silkworm, serving as a basis for the successful manufacturing of silk.

There is plenty of raw material of all kinds in Sonora which can easily serve to support and enlarge existing as well as new industries.

TABASCO

Tabasco might be a great manufacturing State, because it has abundant elements in its favor for becoming one, but it is not. It seems difficult to believe that enterprising men should have failed to realize the advantages of this section and establish themselves here with all the enormous wealth of raw material offering such great inducements for the profitable investment of capital. The factories which Tabasco at present possesses are: two candle works, cigar factories, mineral water works, brick works and one manufacturing dairy products, and a few sugar mills.

As can be seen, industry is in a very deplorable state. In Tabasco the cotton-tree (*eriodendron grandiflora*) is so abundant that the raw material could supply whatever number of cotton mills might be operated in the State. Lack of capital, lack of initiative and lack of workers are the causes of the industrial inactivity which exists. Dye plants, textile plants, building and other timber, etc., abound, that could be the means of establishing large factories in so many lines. At present this State must depend upon others and exchange with them its raw products for the manufactured goods which it requires.

All industries await establishment in the State of Tabasco, with the certainty that they would have the fullest success, not only because of the abundance of the raw products required, and the small cost of sending the manufactured product to market, but also because the latter would have a good foreign market.

TAMAULIPAS

As practically all the attention of the people of this State is devoted to the petroleum industry, the other industrial fields are rather neglected. The industrial undertakings at present existing in Tamaulipas include the following: several iron and steel foundries, three small spinning and weaving mills which manufacture low grade fabrics of different kinds; several cigarette factories, soda water works, candy and chocolate factories, rum distilleries, flour mills, salt works and candle factories.

These data show that industrial enterprise in the State of Tamaulipas is of scarcely any significance; the existing factories are small and unimportant.

All the articles produced are for the local markets and are not sufficient, of course, since large quantities of them have to be imported from other sections of the country. All the raw material used comes from the State, which exports large quantities of it, instead of enlarging its own industries. The leather industry disposes of a certain amount of its goods, such as saddles, etc., to outside markets.

The existing factories are operated either by electricity, hydraulic or animal power. All in all they employ about 300 people.

The following industries could be established on a large scale in the State: cordage and twine factories, using as raw material the fine fiber of the "zapupe" plant (agave derveyana), of which there is a great abundance, as it grows spontaneously in the protected and well-irrigated valleys; this fiber is very fine, soft and strong, altogether of far better qualities than the sisal hemp of which very large quantities are exported from the Yucatan Peninsula

to the United States. Many different articles can be manufactured from the "zapupe" fiber.

The tanning and leather industry could be developed and worked on a large scale by modern methods. The hat-weaving industry could also be worked on a larger scale. Large quantities of beer are consumed, particularly along the torrid sections of the coast; still there is no brewery in the State, all the beer being imported from other States, while all the necessary barley could be grown in Tamaulipas. There is plenty of cotton in the State and more could be grown, so that it would not be difficult to establish large spinning and weaving mills. Furthermore, there is no reason why glass, crockery and high grade furniture should not be manufactured in the State.

TLAXCALA

Manufacturing is being started in the State of Tlaxcala, which already has three factories of some importance, manufacturing a large variety of cloth products, and exporting them to the City of Mexico. About 600 people work in these factories. The remaining industries of the State include mineral water works, the large railroad machine shops in the town of Apizaco which are very important and employ a large number of workmen; a brush factory, utilizing as raw material the "zacaton" grass; and a few small home industries which are scarcely worth mentioning.

The spinning and weaving mills use for their raw material cotton and wool from various parts of the country, the State of Tlaxcala producing almost nothing of this raw material. Mexico City, as we

have stated, is the destination of the products of these factories, and is the chief distributor, in accordance with the needs of the market; as a rule these products are sent to the interior of the Republic.

Electricity is the motive power used by the spinning and weaving mills in this locality, furnished by the Necaxa plant, there being a local power plant in the small town of Tlaxcala.

About 800 people are employed in the factories we have mentioned.

The new industries which in our opinion could be profitably established in this section, are: cordage and allied manufactures, as besides the "maguey" plant there are other fiber-producing plants, such as hemp. Paper mills might also be introduced. The extraction of "candelilla" wax could be started with success, as there are large quantities of this plant in the State. The thread factories might be increased, either by the establishment of new ones or by the enlargement of the present ones, so as to obtain a larger production, the local advantages being: the proximity to the Capital of the Republic, the low rates of transport for both the raw material and the finished product, and the lower scale of wages paid in the State in consequence of the lower cost of living.

VERACRUZ

Industrial undertakings are progressing rapidly in this State, so much so that very soon Veracruz will be one of the leading manufacturing centers in the Republic. Most of the factories work on a large scale. They comprise: weaving and spinning mills which manufacture various cloth fabrics of the ordi-

nary and the better kinds of cloths, sent to different sections of the country; numerous and large sugar mills worked by modern methods and machinery and turning out magnificent products; rum, wine and brandy distilleries, soda water and mineral water works, noodle factories, candle factories, one glass factory, one paper mill, large breweries, large cigar and cigarette factories, alcohol distilleries, soap works, oil mills, brickyards and several others.

Most of the manufactured articles go to the interior of the country, and large quantities of the others are sold abroad.

The spinning and weaving mills use electric power, generated at the waterfall at Barrio Nuevo, Rio Blanco, which should be exploited to a greater extent.

The different industrial enterprises employ, all in all, about 75,000 people, men, women and children.

All the existing industries could doubtlessly be enlarged and new ones established, for the simple reason that all kinds of raw material can be easily obtained and that there is a ready market for all that can be produced.

YUCATAN

The factories established in this State comprise one brewery, three ice plants, two cigarette factories, two factories for construction material, such as floor-bricks, tiles, glazed tiles, etc., several chocolate factories, one match factory, one noodle and biscuit factory, two factories making cordage and similar articles, one soap and perfume factory, one pastry and cake shop and several furniture factories. There are also several foundries and machine shops which

manufacture different models of rasping machines and parts of these; furthermore, several electric power and light plants. Nearly all of these factories are in the City of Merida, Capital of the State. A number of salt works are operated along the coast, obtaining culinary salt by evaporation of the sea water gathered in natural or artificial pools. Ropes and cords are manufactured on most of the sisal plantations in quantities sufficient only for their own use. Every one of the capital towns of the Districts of the State and most of the plantations have their own electric light plant. Small chocolate factories are established in a number of rural towns. The sugar plantations produce alcohol of the best grade, extensively used in the State for industrial purposes.

The raw material used by all these industries comes from different sources according to the articles manufactured. Sacks, ropes, and similar articles are made from the sisal fiber produced in the State; the furniture factories use cedar, mahogany and other precious woods from the forests of the State; but chocolate and cigarette factories get their raw material from other States, other industries get theirs from the United States or Europe.

Most of the articles manufactured in the factories we have mentioned are for the local market, a small quantity only being exported to neighboring States.

The manufacturing of sacks on a large scale from the sisal fiber would be a splendid business enterprise, since there is a very large demand for such articles in the whole Mexican Republic and in nearby Cuba, while the present organization and machineries in use among the Yucatan manufacturers do not permit of an output of bags large enough for

the local demand; in fact the State of Yucatan imports a considerable quantity of sacks made of jute. The Yucatan sisal plant has a number of important industrial applications. Extensive experimenting in the United States with the refuse of the sisal plant as delivered from the rasping mills has shown this material to be most adequate for the manufacture of different grades of paper, all of excellent quality. An excellent alcohol can also be extracted from the agave that produces the sisal hemp. Curtains, mats, caps, footwear, most attractive ladies' hats and a number of other articles can be made and are at present made, though on a very small scale, from the same sisal fiber. The organization of a strong concern and modern machinery are needed to create a perfectly sound industry. Furthermore, it is claimed that sewing thread and an excellent clothing fabric can be obtained from the sisal fiber, subjected to some special chemical process.

The factories in this State use, as a rule, wood or charcoal as fuel to produce their motive power, some employ crude petroleum, gasoline, or even electric power.

ZACATECAS

Few manufacturing industries are established in the State, and the few factories that are operating are of little importance; they include spinning and weaving mills that manufacture shawls, common cotton cloth, woolen blankets, match and candle factories (6), cigarette factories (7), soap works (5), and flour mills (17), metal foundries (4), crockery factories (4), and a few sugar mills, rum distilleries, soda water works and candy factories.

The raw materials worked by these factories

come from various sources; the wool is produced in the State itself; the cotton is brought in from the States of Coahuila and Durango; the mills grind the wheat grown in the State; the rum distilleries use the kind of "maguey" called "cimarron" or "del cerro" (agave asperuna), or the sugar-cane grown in the State.

Nearly all the manufactured goods are for the local market, but the blankets and shawls are well liked in the bordering towns and settlements of the State of Durango. There is a good demand for these articles; for this very reason a great deal more of them should be produced.

The factories we have named are operated by hydraulic or animal power; not more than 2,000 persons are employed in all of them.

Other industries could be started. In the southeastern section of the State there is an abundance of palm-trees which yield a splendid fiber; at present it is not exploited; there is also plenty of "lechuguilla" and nothing is done with it, while it has many applications, especially in the cordage and allied industries. The "guayule" also, instead of being exported, should be used for industrial purposes. There is sufficient material for the running of modern tanneries and leather industries; more sugar-cane should be planted and more factories based on the exploitation of this kind of raw material.

CHAPTER VII

MINING INDUSTRIES

The mineral treasures of Mexico were famous already in the pre-Columbus times. During the Spanish colonization period they became proverbial, the quantities of precious metals found during that time giving rise to fabulous descriptions of the wealth of Mexico. The mines worked during the Spanish colonization epoch are by no means exhausted, and new ones are being constantly discovered and exploited. Even the remains of the mines worked by the Spaniards in the primitive ways known at the time, are still full of fine ore.

Of all the foreign capital invested in the Mexican mining industry the American is the largest; but a number of mines are in the hands of the English, while others are worked by Mexicans or other nationalities.

The right to exploit a mine in Mexico is obtained by duly registering the claims with the Secretary of State in Mexico City. For the corresponding concession a yearly tax of ten pesos (\$5.00 American money) is paid to the Central Government for each hectare of land comprised within the claim. The Mexican law states that everything beneath the surface of the land is not private but national property. Whenever mineral ore, metal or petroleum, is discovered on any private property the owner of the land has the preferred right of exploitation pro-

vided he pays the corresponding taxes, as stated above. The right of exploitation remains intact as long as the taxes are paid, irrespective of whether any actual work is done or not.

Individuals as well as companies are in the possession of mining properties.

The principal gold mines are located in the States of Mexico and Michoacan, in the districts of El Oro and Tlalpujalma; also in the States of Guanajuato, Chihuahua, Oaxaca, Sonora, Sinaloa, Zacatecas, Queretaro, Durango, San Luis Potosi, Tepic, Nayarit and Baja California.

Gold is found in alluvial deposits as well as in pure gold veins, together with silver, or with silver and copper.

The principal silver deposits are in the States of Hidalgo (Pachuca and Real del Monte), Guanajuato, Zacatecas, Chihuahua, Sinaloa, Guerrero and San Luis Potosi.

Lead is mined chiefly in the States of Chihuahua, Hidalgo, Coahuila and Nuevo Leon, but is found also in many other States, in combination with silver and copper.

Pure copper is found in the States of Sonora, Michoacan, Jalisco, Guerrero and Chihuahua; copper in combination with iron—in the States of Sonora, Guerrero, Baja California and Michoacan; copper combined with lead—in the States of Coahuila, Chiapas and Sonora. But copper mines are found also in all the other States.

Zinc is mostly found combined with silver and lead, being often only a by-product in the exploitation of silver. The ores contain from 19 to 45 per cent of zinc. It is chiefly found in the States of Nuevo Leon, Chihuahua, Coahuila and San Luis Potosi.

The production of mercury has greatly increased since the introduction of the cyanide process. The richest mines of this kind are in the States of San Luis Potosi, Guerrero, Guanajuato and Michoacan.

The graphite mines in the State of Sonora are the most important of the kind in the whole western hemisphere, as far as amorphous graphite is concerned. These mines in Sonora are very important; graphite is also found in the State of Oaxaca.

Antimony comes chiefly from the States of San Luis Potosi, Zacatecas, Oaxaca, Chihuahua and Queretaro. The mines of Charcas and Catorce furnish most of the antimony that is exported; the mines and the foundries belong to English concerns.

Bismuth and iron are also found and exploited in Mexico.

Coal mines are worked in the States of Chihuahua, Morelos, Veracruz, Hidalgo, Guerrero, San Luis Potosi, Queretaro, Durango and Tabasco, but the quantities mined do not as yet cover the demand.

Salt is obtained in the salt works "El Penon Blanco" near Salinas in the State of San Luis Potosi, on the island of El Carmen near the coast of Baja California and on the coast of Yucatan from the evaporation of salt water. There are large deposits of salt on one of the Tres Marias Islands, to the west of the port of San Blas on the Pacific coast. The gaining of salt by evaporation of the ocean water is engaged in in many places on the western coast.

Other mineral products are the following: opals, sulphur, onyx, marble, large deposits of phosphate, turquoise and malachite.

Many of these treasures still remain to be exploited.

In Mexico the mining industry still offers tremendous possibilities for men of means, intelligence and industry.

Petroleum constitutes the chief wealth of the Mexican subsoil; its supply is enormous. Formerly the State of Tamaulipas was considered the richest in oil; but gradually in the States of Veracruz, Tabasco, Chiapas and Oaxaca rich oil-producing strata have been discovered, especially in the sections of these States near the coast.

Further down towards the south the crude oils are lighter and more valuable. The oils found on the Isthmus of Tehuantepec are said to be highly valuable.

The petroleum wealth of Mexico is enormous; oil-bearing strata one richer than the other are found every week.

Ninety-seven per cent of all the petroleum strata in Mexico are in the hands of foreigners, especially Americans.

Full details concerning the mine industries in Mexico are given in the following pages, in accordance with the general plan of this book to present conditions in every single State of the Republic.

AGUASCALIENTES

Some fifteen mines are being operated in this State; the most important of these are the mines of the Ballena, San Nicolas de los Angeles, etc. The mining camps are: Asientos, the mines of which produce silver and copper; Tepezala, silver and lead; Rincon de Romos, silver and gold.

The mining industry employs about 8,000 workmen, without counting those who work in the foun-

dries. In Tepezala there are marble and slate quarries of very excellent stone.

There are no coal mines, nor is it known whether petroleum exists in the State; there is, therefore, none of the industries connected with the oil industry, such as refineries, distilleries, etc.

The Asientos mining camp, which is the richest, is somewhat neglected; this appears to be due to the long war in which the country has been engaged. It could again be actively worked and be a source of work and wealth.

BAJA CALIFORNIA

There are several important mining enterprises in the Territory, such as the Santa Rosalia Mining Company which exploits the copper mine of El Boleo, the silver mines of Real del Castillo, Santa Gertrudis, Comodu, San Luis, Mulege, Loreto, and those of El Progreso, El Triunfo and San Borja.

There is also an abundance of lead and iron ore in the Territory, and marble is found all along the Coast Mountain Ridge.

Salt is worked principally on the island of El Carmen, in Ojo de Liebre, on the island of San Jose and also in other places.

Gold is found in its pure state in the sands of rivers and streams and in alluvial deposits, many of which are scarcely known and not at all exploited.

There are large deposits of coal in the Territory, but, as in the case of the metals they still await exploitation.

The presence of petroleum in the Territory has already been demonstrated, wells having been sunk that have proved to be productive. The proper

exploitation of this wealth has not been started as yet, but promises great development activities.

Consequently the mining industry has splendid prospects in this section of the Republic, with regard to the mining of metals, which are worked inadequately and by no means in proportion to the richness of the veins, and also with regard to the exploitation of coal and the hydrocarbons, the existence of which in the Territory is no longer a matter of conjecture.

CAMPECHE

Very old traditions tell of the existence of important layers of copper ore in the District of Champoton; the truth is that the waters of the Champoton river are remarkably cupriferous. Parties interested in this line of business should find it worth while to fully investigate the matter.

The mountainous elevations around the Capital of the State contain large quantities of a white mineral earth, commercially known under the name of "talcum"; the exploitation of this material would be extremely easy, and easier still the shipping of it, since conditions are such as to allow direct loading into the ship from the places of extraction.

Investigations undertaken by experts have established the fact that the subsoil of the State contains petroliferous layers, concentrated between Champoton and the District of Los Chenes. There is no geological reason why there should be no oil in this State, the coasts of which are the continuation of the coasts of American States where oil is being extracted, as well as of the Mexican States of Tamaulipas, Veracruz and Tabasco, where oil has also

been found. The truth is that the subsoil of this State has not been sufficiently prospected.

In nearly all the valleys of the State there is an abundance of a ferruginous clay; hence pottery is still a general industry among the natives who make all kinds of household utensils for the local market.

Silex is found on the exposed coast of Campeche and marble on the shore side of the village of Seybaplaya. None of these quarries are worked.

The salt works located on the windward coast do an important business, the salt being exported to the interior of the Republic.

CHIAPAS

There are in the heart of the sierras of Chiapas quite valuable mineral deposits, but they are not worked, or are so only on a very small scale. There are no worked mines in the State worth mentioning.

The only industry deserving of mention is that of salt extraction carried on along the coast, a very excellent salt being produced which is shipped to the interior of Mexico and to various towns of Guatemala and El Salvador, Central America.

The principal metals produced in Chiapas are: copper, in Esquintal; coal, which is very little worked, iron, silver, gold, talc, asphalt, sulphur (principally near Tapachula), alabaster, nitrate of soda and yellow amber.

None of them are utilized in the manner which the deposits would warrant.

Petroleum has not been exploited up to the present. There has only been some exploration work which proves that it exists. Both oil and coal will very soon be worked on a proper scale.

CHIHUAHUA

The mines of Chihuahua have been famous; the silver mines of Parral have produced large fortunes. The mines of this State have been worked for many years and still are yielding high grade metals.

Notwithstanding the general slump in the mining industry in the whole country, several companies are actively operating, some of them possessing two or three veins. The following are the principal mining concerns in this State: Santo Domingo Silver Mfg. Co., La Gloria, San Gabriel, Tres Hermanos, in Batopilas; the Professor mine, worked by the Professor Mining Company; the mine of Sabinal in Casas Grandes; the American Smelting and Refining Co., Compania de Metales y Minerales, Potosi Mining Co., The Buena Tierra Mining Co., Magda, Planchas de Plata, in Ciudad Juarez; the Apache, in Colonia Dublan; Cusi, Santamarina, San Miguel, Hortensia, Santa Elena, El Mirasol, Promontorio, La Abundancia, in Cusihuiriachic; Compania Minera San Pascual de las Adargas, in Jimenez; La Palmilla, Veta Grande, Presena, El Refugio, San Patricio, and others, in Parral.

These mines produce gold, silver, copper, lead, coal, iron, mercury, etc.

The most famous mines are those of Parral, Santa Eulalia, Minas Nuevas, Palmarejo, Guazapares, Cusihuiriachic, Batopilas, Cerro Colorado, and Corralitos.

Thirty-six thousand workmen are occupied in the mining industry.

No coal is exploited in this State, nor has it been definitely established that there are any deposits of hydrocarbons, though it is thought that eventually

they will be discovered, as has been the case in other sections of the country.

The brightest prospects of the State of Chihuahua certainly lie in its mining industry.

COAHUILA

Although this is not one of the principal mining States in the Republic, its mining industry is nevertheless quite important. There are very rich mineral deposits in the neighborhood of Saltillo, in the sierra of El Carmen, in Sierra Mojada and in other parts of the State. In the matter of subsoil treasures the State of Coahuila owes its fame to the inexhaustible deposits of coal which are exploited in La Rosita, Las Esperanza, Muzquiz and Sabinas. The quantity of coal produced is over one million tons every year.

The mines of this State produce silver, gold, copper, lead and iron. This latter is particularly plentiful in the mountain of Monclava, its ore containing more than 60 per cent of iron.

More than 30,000 people are working in the metal and coal-mining industry; more than half of these work in the coal mines of La Rosita and Esperanzas. The pit-coal used by the National Railroads of Mexico comes from these mines. Much of this coal is exported to the neighboring United States.

In spite of the coal wealth of the State, no petroliferous deposits have been discovered as yet.

COLIMA

The mining industry has been dreadfully neglected in this State, so much so that absolutely no metal is produced, although there are undoubtedly mineral

deposits in the sierras of the State; not even sulphur which is plentiful in the famous volcano of Colima, is exploited.

But there are rich salt deposits all along the coast which, as partly that of the State of Michoacan, is low and sandy. The most noteworthy salt deposits are found in the lagoon of Cuyutlan, which is very extensive and artificially connected with the ocean; also in Pascuales, Cualata, San Pantaleon, Guazongo, Guayabal, Carrizal, Tecuan, Caiman, etc.

These salt works employ more than 4,000 workmen.

There is no coal in this State, as far as is known, but there are great possibilities of the existence of hydrocarbons. Up to the present time not much can be said about the possible prospects of the oil-extracting industry in this State.

DISTRITO FEDERAL

The Federal District has no mining industry of any kind. Quarries, lime, sand, etc., are exploited for construction purposes.

While there are no coal or hydrocarbon deposits in the District, a number of oil refineries are established there, belonging to different petroleum companies.

DURANGO

The State of Durango is a large producer of minerals and a number of things contribute toward making it the most important State from this point of view. We may state at the outset that it has the two largest foundries in the country: the Velardena and the Mapimi foundries; it further possesses more

than one hundred small plants for treating ores. Among the chief mining centers may be mentioned: Guanacevi, Baxis, San Dimas, Ventanas, Copalquin, producing gold and silver; Gavilanes, Topia, Vacas, Quebradilla, Panuco, yielding silver; Velardena, Ojuelo, San Andres de la Sierra, Inde, mining lead and silver; Descubridor, El Cobre, Avino, Canelas and Magistral, extracting copper; and Cerro de Mercado, Durango, producing iron. Sulphur is obtained on a large scale at Mapimi, in the Banderas and Tajada mines. In San Juan de Guadalupe fairly good marble is obtained, and there are excellent quarries in the State, especially near the City of Durango.

The methods which have up to the present time been employed in treating ores are: concentration, amalgamation, lixiviation, cyaniding, smelting and flotation.

The ore production of the State of Durango has during recent years exceeded \$20,000,000 per annum, giving employment to nearly 70,000 workmen.

At San Luis del Cordero and at Mapimi discoveries have been made of mineral fuel; in the first mentioned place, of coal, and in the other, of petroleum. Exploration work has been going on for some time, as it appears also that at San Carlos, near Ciudad Lerdo, the sinking of an oil-well has been started. The working of mineral deposits of the kind mentioned would be of immense advantage to the ore-treating plants in the State.

GUANAJUATO

The mines of the State of Guanajuato are very old; they had been exploited by the Spanish Con-

querors. The principal products of its mines are: galena, gold, silver, lead, copper, bismuth, agates, amethysts, feldspar, etc. The most notable mines are those of El Pinguito, El Cedro, La Central, El Rancho, San Isidro, La Peregrina, La Valencia, Jesus Maria, Mellado, La Providencia, San Juan de Luz. There are good mines in San Luis de la Paz, in Pozos and in other places.

Most of these mines operate on a part time basis, many others are shut up completely, due to several causes, but chiefly to the fact that men possessing the necessary means seem to lack determination to engage in the forceful exploitation of the rich metal-bearing veins, at present almost completely abandoned. The mines of Guanajuato, San Felipe and Silao have been saved from a similar fate and are being worked with certain regularity, as for example the mines of Flores, San Matias, and several foundries.

At present some 50,000 workmen are engaged in the mining industry.

Up to the present time no deposits of coal or hydrocarbons have been discovered in this State. The mining of metals offers the greatest possible field for the investment of capital and energy.

GUERRERO

The mineral treasures of this State have been exploited ever since the Spanish colonization, and are still enjoying great fame. The most noteworthy of all is still the mine of Taxco, a rich producer of gold, silver and lead, treated in the foundries of the place itself, since it would be impossible to send the ore-

stone out of the State. This ore deposit of Taxco is the richest of its kind.

The mines of the State produce every year some 5,000,000 pesos, *i. e.*, 2,500,000 American dollars worth of metal.

About 4,000 people are employed in the mining industry, not counting the numerous persons engaged in fishing gold nuggets in the river sands, for the rivers of this State with the exception of the rivers of the State of Sonora are the richest in gold.

There is coal in the State of Guerrero, but it is not exploited. The principal mines of this kind are Los Grados and La Dicha, in Taxco. In San Nicolas del Oro there are gold and good quality opals. Deposits of coal and opals exist also in Huitzuco.

Petroleum strata are believed to exist in the State of Guerrero, but there is nothing certain about it.

HIDALGO

The reputation of the State of Hidalgo is based solely upon its mines, as famous as those of the States of Guanajuato, Durango, Sonora, Mexico, Zacatecas and others which consider themselves mining States. It is not easy to arrive at the truth as to which State is really the "premier" in this respect whether, as appears from official data, it is the State of Durango, or whether it is, as has sometimes been stated, that of Guanajuato or the State of Hidalgo, as it claims. Fortuitous circumstances sometimes give the pre-eminence to one State and sometimes to another. Hidalgo contains famous mining camps: Pachuca, the Capital of the State is engaged in mining exclusively. Among the most

celebrated mines we may mention: Fresnillo, La Blanca, Maravillas, Santa Gertrudis, Santa Ana, San Rafael, Real del Monte, Dolores, Dificultad, San Ignacio, Cabrera, Tiro Hermoso, Acosta, Guerrero, these last in Real del Monte; and La Concordia, El Carrizal, and others, in Zimapan. They produce iron, gold, silver, lead, sulphate of silver, carbonate of lime, and other products, which are handled in several ore-treating plants.

The mines in the State give employment to not less than 30,000 workers.

The working of the mines could be developed by the use of shafts which at present are being operated on a very small scale. The mining wealth of Hidalgo is inexhaustible and could be worked profitably for many, many years.

Although the State of Hidalgo, in view of its location with regard to the principal deposits of hydrocarbons, should be one of the principal producers of mineral oil, it is not so, and we cannot mention even one industry of this nature. There are probabilities that this much sought after product exists under the soil.

Hidalgo is and will be even more so in the future a vast field for new mining enterprises.

JALISCO

The State of Jalisco does not pretend to be the first mining State of the Republic, but, nevertheless, it has some very rich mines which are quite famous, as for instance that of Bolanos.

The following mines are being worked, though not to a very large extent: several in Ameca, Ayutla, Bolanos, Etzatlan, Guadalajara, Lagos, Mascota,

San Sebastian, Sayula, Tecalitlan, Teocaltiche, Tequila. Not less than thirty mines are important at present. They produce gold, silver, copper, lead, mercury, antimony, coal, "tecali" marble, asphalt and iron. In former years there were not less than eighty flourishing mines in the State, from which large quantities of fine metal were obtained. At present great efforts are being made to regain the former productivity of the mines, and it is certain that before long this State will be one of the most important in the mining industry, which at present gives employment to more than 20,000 people.

There are coal deposits in the State, and a concession has already been granted by the Government for the exploration and the eventual exploitation of hydrocarbons which certainly exist in the southern and western sections of the State.

MEXICO

Although the State of Mexico has not the typical aspect of a mining country, some districts of it are considerably rich in minerals. El Oro has mines of great fame; in Sultepec, Valle de Bravo, Tamaxcaltepec and Zacualpan there are mines which yield large quantities of gold, silver, copper and lead.

The State has excellent quarries, the products of which are sent to the City of Mexico as are also large quantities of lime.

The State has an excellent metal foundry in El Salto and in Valle de Bravo, this district producing a great deal of iron.

At least 12,000 people are occupied in the mining industry.

There are no traces of coal or petroleum in the State of Mexico.

New possibilities will be created as soon as railway lines allow of the tapping of rich districts, such as Sultepec and Valle de Bravo, isolated at the present time.

MICHOACAN

Although Michoacan cannot call itself an important mining State, it has some good mines; among these may be mentioned: Dos Estrellas, in Tlalpujahua, which produces high grade gold and silver ore; the mines of Angangueo and Zitacuaro, Maravatio and Cotija; in Zitacuaro and Cotija there are large deposits of kaolin, so that the making of high grade porcelain would probably be very successful in the State of Michoacan.

The mines of this State produce copper, alum, coal, lead, iron and sulphur, the last two products being found chiefly in the section called Los Hornitos.

At the present time the mines in the State of Michoacan do not employ more than 4,000 workers.

The coal mines and deposits are scarcely worked, and await proper development.

There are also deposits of hydrocarbons, especially in the Huetamo section, where oil-wells will probably be drilled within a short time, with every prospect of success.

MORELOS

Mining is not the principal industry engaged in by the people of this State; nevertheless it has some very important mineral deposits, greatly neglected at present.

Fairly good marbles and quarries are exploited in Yautepec; the product goes to the City of Mexico. In several sections of the State there are mercury, gold, silver, lead, alabaster and lithographic stone which is sent to Mexico City.

As can be seen, the State of Morelos could not be called a mining State.

Investigations are being made in order to ascertain whether there is petroleum in its subsoil. At any rate the progress and welfare of the State cannot be based on the mining industries.

NAYARIT

There are some mines in Compostela, Ixtlan and Santiago Ixcuintla, which are being worked, though not actively. Silver, gold and copper are the principal products. The mines of El Sol de Oro, Piedra Verde, El Zopilote, Mojocutla, La Purisima, La Luz, Los Tejones, La Cucaracha and two or three more in Ixtlan have good paying minerals which at the present time are only imperfectly treated.

No more than 2,000 workers are at present occupied in the mines of this State; this proves how relatively unimportant they are.

No coal is exploited in this State, and no formal work has as yet been undertaken to determine the existence of oil in its subsoil.

NUEVO LEON

Due to the general decay of economic life of the whole country in the last few years, the State of Nuevo Leon has witnessed a decline in its mining industry contrasting painfully with its activity in

former days, but it feels confident that a gradual improvement in conditions will not fail to come, in view of the latent wealth of its soil and subsoil.

Various mines are being worked: La Fraternal, La Plomosa, Flor de Pena, in Lampazos; several concerns in Monterrey and veins in other sections of the country are being worked at present; they produce chiefly iron, silver, lead, zinc, copper, cinnabar, coal, white marble, onyx and sulphur.

Coal is exploited, though in a lesser degree than in the State of Coahuila.

Nothing positive is known as yet with regard to the existence of hydrocarbons in this State, notwithstanding its comparative proximity to the oil layers of Tamaulipas and San Luis Potosi.

The existing mineral veins and the new ones that in all probability will be discovered offer a fertile field for the mining industry in this State.

OAXACA

It cannot be said that proper attention is given to the rich deposits of ore in Oaxaca, although it might appear so from the fact that there are several smelting works in the State. But the truth of the matter is that the mines are operated without care, and are not worked to their full extent. The best known mining centers are: Ocotlan, where gold, silver and copper are produced; Ejutla, where the mines are completely shut down, although they are very rich; Tlaxiaco, which has some very rich ore deposits. Huajapan de Leon has some deposits of coal which have not been worked yet. Mining here has an additional great source, which is within everybody's reach, namely the sands of some of the rivers near

the border of the State of Guerrero, which contain nuggets of gold.

Besides gold, silver, copper, iron, zinc, lead, antimony and coal, Oaxaca produces high grade marble, onyx, similar to the celebrated onyx of Tecali in the State of Puebla, and highly valued porphyries.

In recent years hydrocarbon exploration work has been carried on in all the southern States, and it is stated that bitumens are found in the majority of those States. This also has been done in the State of Oaxaca, and various concessions have been granted for exploration work and the drilling of wells. On the side which adjoins the State of Puebla, some companies have worked out oil claims.

Coal is found, but it has not been worked so far.

The mining camps of Taviche, Totolapan and San Jose have metal foundries.

PUEBLA

Puebla cannot be called a mining State, at least not in the sense the word is applied to a number of other States in the Republic. It has, nevertheless, a number of mineral deposits, such as those of Teziutlan, which contain gold, silver, copper, iron, lead and zinc; there are also some silver layers in Atlixco. The State of Puebla is famous for its fine onyx and Tecali marble. Its onyx especially is in great demand. Of late the price of this onyx has been about 250 dollars per cubic meter. The people of this section of the State manufacture wonderful articles made of onyx, such as inkstands, jewelry boxes, paperweights, statuettes, animals, etc.

About 2,000 workmen are engaged in the mining industry in this State.

Coal is exploited to a very small extent in the section called San Juan de los Llanos.

It is possible that there are hydrocarbons in the southern section of the State; explorations have been carried on there. No oil has been exploited in this State so far.

Systematic exploitation of the coal deposits should yield splendid results.

QUERETARO

The mining industry is carried on in this State on modest but sure and positive lines. There are more than one hundred mines in the State, a few only being worked, though not as fully as in former times.

The principal mineral deposits are those of Cadereyta, Jalpan, Toliman, Pinal de Amoles and Tequisquiapan. The mines worked at present are those of Mina Grande, El Penasco, Santiago, La Gachupina, La Concepcion, Los Lirios, and several others.

The mines of the States produce gold, silver, antimony, galena, mercury and iron; there are also mines that yield agate, opals and coal.

The exploitation of opals is a very popular industry in this State; a large number of people are engaged in it, producing some fine and highly prized stones. The industry is not properly organized and therefore does not yield the results that could be expected.

There is coal in several mines, but its proper exploitation has not even been started.

Nothing positive is known concerning the existence of hydrocarbons in this State.

QUINTANA ROO

No mining whatsoever is done in the Territory of Quintana Roo, nor have any layers of metal, coal or oil been discovered there up to now.

SAN LUIS POTOSI

Although the name of the State is almost synonymous with mining, as the name was given to it for the very reason that it was considered to be as rich as the famous Potosi in Peru, its mining industry is not so flourishing as might be supposed, although the State has one very important mine.

The mines which are being worked are those of Matehuala, among which we may mention the following: Dolores, Trompeta and dependencies, La Trinidad, La Paz, Catorce, Cedral, Guadalcázar (today "Iturbide") and those which gave rise to the name of "Potosi" for the State, the mines of San Pedro, among which we must mention the Barreno mine. Villa de Reyes is also an important mining camp.

The salt-extracting industry is carried on at Salinas in the Salado section. The salt manufacturing company of the State, which exploits the salt deposits is called "Salinas of Mexico," being locally known under the name of "Salinas de Penon Blanco"; it supplies the whole of the country with salt. It has other producing centers, such as Michoacan, Manzanillo, etc., but the Salinas de Penon Blanco are the most important of all, both on account of their enormous production as well as the high quality of the product.

The mines of the State produce principally silver

in Matehuala, Catorce, and Cerro de San Pedro; there are quarries at Guadalcázar, which produce excellent stone. The State produces also antimony, cinnabar, gold, copper, lead and zinc to a certain proportion in its silver mines. As a matter of fact all the mines in the State of San Luis Potosí are silver mines.

The mining industry, in which we include the salt-extracting industry employing at least 5,000 people in this State, offers employment to about 25,000 men.

Coal is not mined in the State, although it is believed to exist, but no efforts have yet been made to undertake any exploring work.

Petroleum strata are plentiful in this State, a number of wells having been sunk already. Several refineries are established in Ebano. The petroleum industry of the State offers the most brilliant prospects, there being sections in which no boring operations have as yet been carried out; such sections are now attracting much attention as reserve fields for the companies devoting themselves to this industry. Mining, which at the present moment is in a state of decline owing to certain unfavorable conditions, will be eventually developed with the certainty of success.

SINALOA

This is a great mining state. As is the case with the State of Sonora and the Territory of Baja California, many of its rivers carry gold nuggets. The mines produce high grade silver, gold, copper, lead, iron, tin and cinnabar. Unfortunately, the principal mineral centers, such as Rosario, San Ignacio, etc., have no proper shipping facilities for the moving

of their products, which makes the mining less profitable than would be the case if such facilities existed.

Many mines in this State are being actively worked, among them the following: El Tajo, Panuco, Realito, La Prieta, Nuestra Senora, Bolanos, Iguana, Rosarito.

The number of workers at present engaged in the mining industry does not compare with those employed in former times; it does not exceed 5,000.

As far as known there are no deposits of coal or petroleum in this State.

The future of the State, as far as the mining industry is concerned, lies in the resumption of former activities and the full exploitation of the existing mineral deposits.

SONORA

The State of Sonora is considered to be the leader among the mining States of the Republic. Its great mines produce copper, gold, silver, antimony, cinabar, iron, graphite, marbles, jasper, onyx, rock salt and coal. There are good foundries in Guaymas, Cananeas and Hermosillo.

Some of the mining concerns are the following: in Cananea: Cananea Consolidated Copper Company, The Soud Cananea Copper Company, Bisbee Cananea, Nacozari Development, La Mexicana, El Alacran, La Democrata, Santa Catarina, Cerro Blanco. In Nacozari: Los Pilares, of the Moctezuma Copper Co. In Lampazos: El Tajo, Pilares de Tebas, El Tigre; the first two yield silver and the last named gold in its pure state. In Arispe: El Picacho, El Carmen, Las Chispas, El Basaitequi, and the placer mines of Bacoachi, where large gold nuggets are found. In Sahuaripa: La Bufa, pro-

ducing high grade silver, and La Trinidad which yields gold. The gold produced in this mine is 950 per mil pure, *i. e.*, purer than the United States gold pieces. In Hermosillo: La Brozuda, La Carmela, La Confianza, La Colorado, El Tramado, La Lluvia de Oro, Las Animas, La Zacatecana and others. Placer mines are found in the neighborhood of Hermosillo, in a place called Suaqui Grande. In Magdalena: Planchas de Plata, Cerro Prieto, La Brisca, Clondyks. In Altar: Llanos de Oro, El Tiro, La Yaqui, La Reina del Cobre. In Alamos: La Virginia, Dios Padre, Valenciana, yielding gold and silver, etc.

Most of the rivers in this State carry gold granules.

The coal mines are not exploited to their full extent, though they are doubtless an important source of wealth.

There are no signs of the existence of petroleum in this State, up to the present time at least.

TABASCO

The mining industries are unknown in this State owing, in the first place, to its geological formation which is alluvial, and because the State has no mountains.

There are very strong probabilities that immense deposits of petroleum exist under its soil, explorations on a large scale and the sinking of oil-wells being well under way.

TAMAULIPAS

The mining industry is growing weaker every day, notwithstanding the richness of the mines which were exploited in former days.

There are mines producing silver, lead, copper, bismuth, antimony, coal, iron and marble in the Sierra Madre Oriental which crosses the southern section of the State. At present scarcely a few mines in the district of Jaumave are worked.

But unusual activity is shown in the exploitation of the oil wealth of the State. The principal oil fields of the State of Tamaulipas are located in Ebano, Chijol, Carrizalillo, Dona Cecilia and Arbol Grande. There are wells that produce more than 160,000 barrels of oil a day. Several oil refineries are operating in Tampico, and in Arbol Grande. These refineries are complete, there being no topping plants as in Veracruz for the separation of the products.

There are important salt works in the State, principally in Soto la Marina; in this section there is asphalt which is also being successfully exploited.

TLAXCALA

There are no mining industries in this State. It is possible that there are mineral deposits under the surface which contain some of the metals in sufficient quantity to make their extraction a paying proposition, but at the present time nothing is being done in this respect, nor has any oil-drilling been done here, as no traces of the existence of hydrocarbons have been discovered.

VERACRUZ

Although the gigantic success of the petroleum industry has completely overshadowed all other mining enterprises, there are, nevertheless, very

large and paying metaliferous deposits in the State of Veracruz, which produce gold, silver, lead, copper, iron, mercury, coal, asphalt, marble, opals, agates, lapis lazuli and amethysts. Various districts of Orizaba are located on large lakes of petroleum.

The petroleum industry has nearly eliminated all the other mining activities, but in time these will receive renewed attention.

The whole attention of the State is concentrated on the petroleum industry. Some coal is mined in San Andres Tuxtla, where coke is also prepared.

An abundance of oil is found in the fields of Chinampa, Amatlan, Juan Casiano, Naranjos, Tancochin, Zacamixtle, Solis, Zapotal, Tantoco, Toteco, Cerro Azul, Tierra Amarilla, Potrero del Llano, Alamo, Cerro Viejo, Tenapache, Numatitlan and in a number of other places.

The northern section of the State is crossed by various oleoducts, some laid to the port of Tampico, and others to Tuxpan, Puerto Lobos, Dos Bocas, etc., where the oil is stored in a number of steel tanks, each of these being capable of holding 55,000 barrels of petroleum.

The extraction of oil is feverishly engaged in by American and English companies and such of other nationalities. There are oil-wells in the petroleum section of this State the productivity of which is enormous. The potentiality of the Juan Casiano well, no longer exploited, and the Cerro Azul well, still worked, is calculated at 250,000 barrels a day. Many other wells under operation produce 100,000 and others 60,000 barrels daily, though there are others that produce only a few thousand barrels a day.

The State of Veracruz furnishes two-thirds of the entire petroleum production in Mexico.

Most of the oil refineries operated in the country are located in territory of this State, for with the exception of three located in Tampico all the others are found in this State.

Three topping plants, the object of which is simply to separate the products, are being operated: one on the right bank of the Panuco river in front of Tampico, another in Tuxpan, and the third in Puerto Lobos.

Oleoducts run from Chiconcillo to Puerto Lobos, from Palo Blanco, Chiconcillo, Tepetate to Agua Dulce; another crosses the Tamiahua Lagoon, starting from Las Huastecas; another runs from Los Naranjos and Zapotal to Mata Redonda, etc.

All these data give an idea of the tremendous activity in the petroleum industry in this State employing thousands of workmen. Other sections of the State have also been successfully explored, and shown to contain equal oil wealth.

At present the State of Veracruz is the wealthiest among all the States of the Republic of Mexico. The State Treasury is always well supplied with money.

YUCATAN

There are no mines of either coal or metals in this State.

Beds of gypsum are found in the district of Peto; nobody has ever paid attention to them, although gypsum has a large demand in the State. Excellent clay, employed by the people of that section for the manufacturing of earthenware, is found in the district of Ticul. There are extensive quarries in the

same district, from which highly valuable construction material is obtained, the stone presenting beautiful colors and veins.

As far as petroleum is concerned rich oil-producing strata exist in the subsoil of this State, according to the statements of noted geologists who have made a careful study of the subsoil in this territory and in that of the neighboring State of Campeche.

ZACATECAS

The State of Zacatecas owes its fame to the wealth of its mines. Unfortunately, the mining industry is greatly declined, scarcely a few of its richest veins being at present exploited on a small scale.

Only a number of old-timers, satisfied with what little they get out of them and working with very imperfect means and in accordance with antiquated methods, are operating the following mines: in Zacatecas, one of the most famous mineral deposits in the Republic: El Eden and San Manuel; in Fresnillo: the famous mines of Proanos, the people working just enough not to desert the mines altogether; in Concepcion de Oro: some of the rich argentiferous deposits of Sombrerete, Los Tocayos and Santa Rosa; in Chalchihuites: El Purgatorio; in Nieves: Ojo Caliente; in La Noria de San Pantaleon: Mazapil and Plateros. Numerous veins are abandoned, or nearly so, as for example the mines of Quebradilla, Tiro de Lete, Los Campos, San Fernando, and a hundred more in Zacatecas; Veta Grande; various mines in Fresnillo; San Pedro in Sombrerete; Tejuairon, etc., in other sections of the State.

All these mines used to produce,—and all will pro-

duce once more for the proper enterprising parties that care to go into such enterprises—antimony, cinnabar, copper, iron, silver, gold, lead, mercury and zinc, in large quantities.

At present not more than about 5,000 people are engaged in the mining industry in this State.

This State does not produce any coal, nor have we been able to find out anything reliable concerning the existence of hydrocarbons in the subsoil.

But we should like to emphasize again that the reopening of those mines that are entirely abandoned, and for the working of which the necessary concessions can easily be obtained from the Government, and the exploitation of new mines in this State would be a splendid investment.

CHAPTER VIII

CLIMATE—RAINFALL—SIERRAS—RIVERS—WATER- FALLS—LAKES—LAGOONS—ARCHAEO- LOGICAL RUINS—SIGHTS

Climatic conditions in Mexico are influenced by the elevation above sea level and the general terrain rather than by the geographical location and the effects of neighboring territories.

The Mexican people generally speak of three different zones in which the temperature varies according to elevation: the "Tierra Caliente" or hot zone, the "Tierra Templada" or temperate zone, and the "Tierra Fria" or cold zone.

The hot zone comprises the sections of the country along the coasts and the flat land of the Yucatan Peninsula, up to an elevation of 1,000 meters above sea level. Here precipitation varies from 770 to 850 millimeters, the average temperature varying between 20 and 25 degrees Centigrade. (One meter is equal to about 39.37 inches, and one centimeter to about one-fourth of an inch, one millimeter is the tenth part of one centimeter.) Climate and vegetation are tropical. The growth comprises palm trees, sugar-cane, rice, cocoa, sisal hemp, tropical timber and dyewoods.

The temperate zone is called the sections of the country situated at 1,000 to 2,000 meters above sea level, where the average rainfall during the year varies between 660 and 770 millimeters. The mean

temperature varies from 15 to 20 degrees Centigrade. The climate is subtropical, and its vegetation includes coffee, vanilla, sugar-cane, corn, wheat, oaks and pines. In some sections the nights are extremely cold, the temperature often dropping to the freezing point.

The cold zone comprises all such sections of the country as are situated at elevations above 2,000 meters above sea level. Here precipitation varies from 480 to 660 millimeters. Some are of the opinion that the cold zone begins only at an altitude of 2,400 meters above sea level. The mean temperature in this zone varies from 19.5 to 22.5 degrees Centigrade; the average yearly temperature is from 10 to 15 degrees Centigrade up to an elevation of 3,000 meters above sea level. During the winter months freezing is quite common. Here wheat and similar grains, Irish potatoes and northern or European fruit grow. The cactuses and the agaves are typical of these regions. The uncultivated areas are partly subtropical steppes, partly forests of oaks, pines or conifers, willows and ash trees.

Rainfall varies in the different zones. The rainy season for the whole country is from May to October. The rainy season is called in the country "tiempo de agua," and the dry season "tiempo de seca." Rainfall is most plentiful along the Atlantic Ocean. The entire northwestern section of Mexico, including the Peninsula of Baja California, is very dry. Rain is infrequent and very irregular on the northern high plateau (Mesa del Norte).

The States situated within this zone have as a rule a very hot summer and a fairly cold winter. Towards the south the climate is milder and the rain more plentiful.

On the central plateau (Mesa Central) there are at times heavy rains during the dry season, as a consequence of the strong northern winds coming from the United States, generally accompanied by a sudden fall of temperature; the southern States of Chiapas, Oaxaca, Michoacan and Guerrero are influenced in a similar way by the southern winds.

The snow area lies more or less at 4,500 meters above sea level, but light snowfalls occur also on the tropic plateau.

The temperatures in the temperate and cold zones are subject to great variations, there being a great difference between night and day temperatures and those in the sun and in the shade.

Very little changes occur in the temperature of the tropical zone, with the exception of that caused by the north winds.

The healthiest and most agreeable climate is on the central highland; then it becomes gradually less healthy towards the south, especially along the coast.

Further details concerning the different States are found in the following pages.

AGUASCALIENTES

Climate.—The State enjoys throughout an almost uniform climate, as there is a very slight difference in location and altitude between its various sections. Usually the climate is mild, the average temperature being 17 degrees Centigrade. Its mountain system is not very extensive or very high, so that this does not lead to great diversity of climate.

Rainfall.—The sky of Aguascalientes precipitates a fair amount of rain and the non-irrigated crops are generally successful. The rains are regular and

fall between June and September, there being a mean annual rainfall of 460 millimeters.

Sierras.—The principal mountain ranges of the State are those of Calvillo, Asientos and Tepezala, none of the mountains exceeding 2,200 meters above sea level. The City of Aguascalientes is 1,908 meters above sea level.

Rivers.—There are only two rivers: the Aguascalientes, which rises in the "Ojos Termales" quite near to the Capital, and the Calvillo. The first mentioned empties itself into the Santiago, or Toluotlan, and the second is a tributary of the Juchipila river which, coming from the State of Zacatecas, unites its water with those of the Bolanos river which in its turn is a confluent of the previously mentioned Santiago. Neither of these rivers is navigable, nor has either any waterfalls of interest, though, of course, some could be formed for the purpose of obtaining electric power, especially on the Calvillo river. There are some small streams, such as the Asientos, Refugio and others.

BAJA CALIFORNIA

Climate.—An excessively hot climate prevails in the Territory of Baja California. The mean annual temperature is 36 degrees Centigrade, almost uniformly in the whole Territory. There are parts, as the famous desert of Yuma, where it is still warmer, especially due to the fact that this section lies in a depression of a lower level than the ocean, being completely dry and hot.

Rainfall.—Rain is very infrequent in this country, the mean yearly precipitation being about 120 millimeters.

Sierras.—Sierras extend all along the coast of the Peninsula, being quite low as a rule, since nowhere does the altitude exceed 600 meters above sea level. Towards the central part of Baja California there is a volcanic region, the principal crater of which is located in the volcano of Las Virgines, the highest spot of these sierras, at about 800 meters above sea level.

Rivers—Lagoons.—The rivers which carry a regular quantity of water are: Tijuana, San Rafael, San Telmo and Santo Domingo.

The laguna Salada (the Salt Lagoon) is the only one worth mentioning. The Colorado river crosses a small portion of the Peninsula, the territory it irrigates being known under the name of Valle Nacional, already fit for agriculture, due to the gigantic irrigation works built on that river.

CAMPECHE

Climate.—The climate in the State of Campeche is dry and hot during the dry season, and mild during the winter months. The average temperature during the year is 25.5 degrees Centigrade.

Rainfall.—The rainy season begins in June and ends in October; the average yearly rainfall reaches 807.2 millimeters. The north wind begins to blow in October, accompanied generally by drizzle, lasting to the beginning of February.

Sierras.—The orography of the State shows that the ranges of hills which cross its territory are spurs of the Sierra Madre, one ending near Tecax in the State of Yucatan, and the other in the District of Los Chenes in this State. The altitude of these hills varies between 40 and 50 meters above sea level.

Rivers—Lagoons.—The hydrography of the country is interesting only in the District of El Carmen, where the rivers Palizada, Mamantel, Candelaria and others of less importance, a number of lagoons and springs fertilize the soil. In the District of Champoton there is the river of the same name, renowned since the time of the Spanish Conquest, for at the mouth of this river the Conqueror Hernando de Cordova fought the famous battle, during which he lost his life in a manner known in Mexican history under the name of "Mala Muerte" (bad death). Natural lagoons or large ponds are found everywhere in the State, some of these drying out during the summer or dry season of the year, while others have water all the year round. In the lowest parts of the valleys there is a number of peculiar sinks, where the waters from all around gather and disappear noisily under the ground as through a funnel, then emerging at low places near the coast. Along the seacoast a good many estuaries are formed by the ocean, frequented by all kinds of sea birds.

The whole coast of Campeche offers most picturesque views. Among the marvels of Nature we mention the wonderful grotto of Xtacumbil-Xunaan, in the District of Los Chenes and described by the Explorer Stephens. From the entrance of the grotto to where water is found there is a distance of 1,400 feet. The perpendicular depth of the water is 500 feet. The grotto has seven ponds of drinkable water and most wonderful columns of stalactite. The beauties of the river Candelaria in the District of El Carmen, captivate the traveler and tourist; this river has many waterfalls which could be utilized for industrial purposes.

CHIAPAS

Climate.—The prevailing climate in the State is the torrid, it being at times extremely hot on the coast and in the famous desert of Lacandon. The mean average temperature is 18 degrees Centigrade.

Rainfall.—The rains which are abundant and fall throughout practically the entire year yield an average precipitation of 2,000 to 2,800 millimeters. The rains fall from May to October.

Sierras.—The mountains which cross the State come from the "Nudo de los Altos" (high knots) in Guatemala, Central America, and where they enter Chiapas territory they have a height of 2,500 meters, the height gradually becoming less until in the Isthmus of Tehuantepec they are not higher than 250 meters above sea level. The principal sierra is known by the name of the "Sierra Madre del Sur," and also by those of "Sierra de Chiapas" or "Sierrita." The most precipitous mountain, an almost inaccessible one, is that of Hucitepec, where the peak of the same name rises to a height of 2,717 meters; the others are: the "Cerro de Ixbul," which rises nearly 3,000 meters; "Tzontehuite," 2,858 meters; Niquivel, 2,753 meters; Tacana, 4,057 meters; Santa Isabel, with a height of nearly 5,000 meters. The Sierra of Cuchumatanes is another of the mountain ranges which traverses a small portion of the State.

Rivers.—The large rivers of Tabasco, the Grijalva and the Usumacinta, take their rise in Chiapas or at least are joined by their chief confluent there, though their true origin is in the Territory of the Republic of Guatemala in the Sierras of Verapaz and Nudo de los Altos. The principal rivers are:

Usumacinta, navigable for more than 100 kilometers within the State of Chiapas, with its tributaries, the Chixoy, the Rio de la Pasion, San Pedro, Lacanja, Cristalino, Cedro, Budsijah, Chicoljah, Chacamas, Istelija, Bascan, Tulija, Michol, La Soledad, Tzacnaja, Grande, Jatate, Santa Cruz, San Gregorio, Chejal, Blanco, Cuilco, Concordia, Dorado, Escalera, Santo Domingo, Tres Picos, Tablon. Into the Mezcalapa river, which later on in Tabasco territory is called the Grijalva, are emptied the following rivers: Suchiapa, Sabina, Chiquito, Chiapa (which goes through Tuxtla), Santa Lucia, Jiquipilas, Zintalapa, Rio de la Venta, Totopac, Yomono, Tzinbacho, Santa Monica, Platanar, and Vamoapa. It is a vast network of rivers, as it is very difficult to distinguish which are the tributaries of the Grijalva or of the Usumacinta near the point where they meet. Numerous rivers flow towards the Pacific Ocean which are all of the nature of torrents, forming various waterfalls as they descend rapidly to the sea from the steep heights of the Sierra Madre del Sur. Those which are worthy of mention are the Suchiate, which forms the boundary of Mexico with Guatemala, the Lacandon, and the Tonalá. The others are less important. As in the State of Tabasco, the rivers form various lakes.

The waterfalls on the rivers which empty themselves into the Pacific Ocean can be used for the generation of power, a matter which has been totally neglected up to now. It would be of great advantage at present for the lighting of the cities of Chiapas, for the establishment of factories operated by electric power, and, especially, for the creation of light electric tramways, which we think will

have to be the traffic means adopted by districts in which the soil is possibly not firm enough to allow of the passage of the heavy trains of the Pan-American Railroad.

Archaeological Ruins.—The most notable ruins are at Palenque, the ancient headquarters of the Maya Quiche race and believed to have been the most popular center of those peoples. They are pyramids crowned with palaces of heavy construction, and worth a visit; the Indians called these pyramids "cues." At Chilon there are ruins of edifices of Mayan origin.

CHIHUAHUA

Climate.—The climate of Chihuahua is on the whole dry and healthy. In its immense unprotected plains it is very hot in the summer and very cold during the winter months. In the winter snowing is not a rare occurrence in the cities of Chihuahua.

The mean temperature during the year is 10 degrees Centigrade.

Rainfall.—The rainy season in this State lasts generally from June to September, the average yearly precipitation being less than 50 millimeters in the section called the Bolson, of 260 millimeters in the central valleys and 400 millimeters in the mountains.

Sierras.—The "Sierra Madre Occidental" crosses the State where it has its highest peaks, many counterforts, and a multitude of deep valleys and canyons. The principal mountain chains are: the Sierra of Tarahumara, the Sierra of Parral, those of Jimenez, Rosario, Madera, Bachimba, Escalon, Casas

Grandes, the highest peaks being those of the Jesus Maria and the Tabasotes mountains. In the desert region there are sand dunes known under the name of "Medanos de Samalayuca," the most barren and desolate section of the State, where absolutely nothing grows.

Rivers—Lakes—Lagoons.—The principal rivers of the State are: the Conchos, into which flow all the rivers the waters of which go to the Rio Bravo del Norte. The confluent of this river are: the Florido, formed by the rivers Parral, Valle, Primero, Concepcion, Encantado, etc. The other rivers that form the Conchos are: the Chuisar, Sacramento, San Pedro, Carretas, Cusihiuriachic, Nonoava, Tecorichic, San Juan, Los Gallos. In this State rise several of rivers that empty themselves in the Pacific Ocean, such as the Papigochic, the Fuerte river and others.

The central section of the State is crossed by three rivers: Casas Grandes, El Carmen and El Santa Maria emptying themselves into the lagoons of Guzman, Santa Maria and Patos, enclosing a valley, where agriculture could be easily developed.

Near the center of the State there is the extensive lagoon of Los Mexicanos, and near Camargo the gigantic water dam of the Conchos river, called the lake of Conchos. Several similar lakes could be constructed for irrigation purposes, utilizing several streams, some of which are medicinal, such as the stream of the El Salado which contains Vichy salts, the Jabali and others. On the banks of the Conchos lake is located the electric power plant, not as large as that of Necaxa but larger than any other in the country; it provides electric light and power to the city of Chihuahua. In the lake which is very beauti-

ful there are several islands, such as El Alamo, La Herradura, Josefina and others. Steamers ply across this lake.

Among the rivers of the State the Conchos is navigable for a distance of several hundred kilometers.

Most of the rivers have waterfalls, none of which have been utilized up to the present time, since all the electric power in the State is obtained from the Conchos lake. This does not mean to say that the other waters could not be utilized, especially those of the Sierra Madre.

Archaeological Ruins.—In the district of Casas Grandes there are ruins left by former inhabitants of this section of the country (the Toltecan Indians) who possessed a somewhat higher civilization than that of most of the tribes of the north. The tribes that constructed these ruins are called "Indios Pueblos." They constructed houses with terraces of four and more stories, in the form of forts which served as dwelling houses as well as places of defense against the attacks of the Apache and Comanche Indians of the region, who were feared on account of their bravery and cruelty. Historians believe that in this State was situated the famous "Chicomostoc," described in the native codices as the parting place of the Seven Nahuatlac Tribes that, after a migration of three hundred years, populated the Valley of Mexico.

At Moctezuma there is a hill covered with ruins of fortifications composed of circular concentric rings built of stone; on the slope of the hill there are remains of fortified works and of a very ancient town. The rocks show hieroglyphic inscriptions and the head of an idol.

COAHUILA

Climate.—The climate of the State of Coahuila varies greatly according to the different sections of the State. It is very cold, but at the same time very healthy in Saltillo and in the places situated in the Sierra Madre Oriental (the eastern mountain range), branches of which are the Sierras del Carmen and La Paila; cold also prevails in Sierra Mojada, that is in the western section of the State. The climate is very hot in the Bolson region, in Monclava, Cuatro Cienegas, Piedras Negras and along the tributaries of the Bravo river.

In the first-named section (Saltillo, Ramos Arispe, Sierra Mojada, etc.) the mean annual temperature is never higher than 12 degrees Centigrade. It is of 30 degrees on the average in the other region.

Rainfall.—There is sufficient rainfall in the cold regions, lasting from June to September, and permitting the so-called "secano" (dry) planting in the farms of the eastern and northeastern sections of the State. Rain is a rare occurrence in the Bolson region. The mean annual precipitation in the oriental section of the State is about 300 millimeters; it is extremely insufficient in the Bolson region.

Sierras.—The Sierra Madre Oriental penetrates into the State of Coahuila; its ridges are higher than those in the States of Nuevo Leon, Tamaulipas, etc. Worthy of special mention are the peaks of Pico Esterea, near the border line of the United States. The Sierras of La Paila, El Carmen and the Sierra Mojada have altitudes of more than 2,300 meters above sea level.

One of the most beautiful valleys of the State is that of Ramos Arispe, very near to the City of

Saltillo, and the famous canyon which leads to Cienega de Flores, where there is a waterfall which could very well be utilized for the generation of electric power.

The Valley of Parras is very beautiful, and there are many places worth while seeing, even in the barren region of the Bolson de Mapimi, where the dreary uniformity is at times interrupted by sierras, such as that of El Muovano, into which excursions are made during the hunting season.

Rivers—Lagoons.—The principal rivers of the State are: the Nazas which comes from the State of Durango, carrying plenty of water only during the floods caused by the torrential rains in the sierras of Santiago Papasquiaro. The Aguanaval river rises in the State of Zacatecas, penetrating into the State of Durango at San Juan de Guadalupe, whence it flows into the State of Coahuila. Along this river there is a good cotton belt. The rivers Salado, San Juan and Sabinas rise in the State of Coahuila and empty themselves into the river Bravo del Norte.

None of the rivers of this State are navigable, with the exception of the river Bravo which forms the border line between the State of Coahuila and the United States; it carries just enough water to float canoes and pontoons. Larger vessels ply near the mouth of the Bravo in the Gulf of Mexico, in the State of Tamaulipas.

There are two large lagoons in this State: that of Arras, into which flow the streams of the Aguanaval, and of the Mayran or El Muerto, in the center of the Bolson region, which receives also the overflow from the Nazas river, and the occasional streams which come from the solitary sierras of the desert.

None of the rivers named has any waterfall worth mentioning. There is, however, one place in Cienega de Flores, where a waterfall could be utilized for the production of electric power.

COLIMA

Climate.—The climate is very hot in the entire State, the average temperature being, with little variation, 27 degrees Centigrade.

Rainfall.—The regular rainy season lasts from June to October, the average quantity of rainfall being 935 millimeters, that is in the central section of the State, for it rains a little more along the coast and a little less in the northern region.

Sierras.—On the border line of the State of Colima with the States of Michoacan and Jalisco the great mountainous chains of the Sierra Madre de Sur (the southern mountain range) come together, after crossing the States of Oaxaca, Guerrero and the southern section of Michoacan, and the so-called Volcanic Axis of Mexico, which, starting from the Volcano of Colima enters the State of Michoacan under the names of Sierras of Jiquilpan, Maravatio, Zitacuaro, etc., joining the Sierra Madre Oriental at the famous peak of Orizaba. The section of the State of Colima where all these mountain chains unite, is very abrupt, giving rise to large deep valleys, such as those of Atentique, Bateas, etc. The various mountain spurs which cross the State go by the names of the region which they traverse. The most notable mountains are the Nevado of Colima at 4,304 meters above sea level, and the Volcano of Colima, at 3,386 meters.

Rivers—Lagoons.—The principal rivers are: the

Coahuayana, on the border line of the State of Michoacan, whose tributaries are the Tuxpan, the Armeria, navigable to the extent of about 25 kilometers and more, with the aid of some canalization works; the Cohuayana, also navigable to the extent of 30 kilometers. The other rivers are of small importance. The Cohuayana river which rises in a very broken region, has numerous waterfalls which could be utilized for the production of electric power for the benefit of the entire State and for the establishment of electric railway lines between the city of Colima and the port of Manzanillo and along the lagoon of Cuyutlan. This lagoon is navigable and has an area of 60 square kilometers.

Archaeological Ruins.—Ruins of edifices and sepulchres are found at a point called Salagua in the Bay of Manzanillo. They are remnants of Tarascan civilization. Similar ruins exist at Tuxpan, also of Tarascan origin.

DISTRITO FEDERAL

Climate.—The climate of the Federal District is cold but healthy and agreeable, the mean annual temperature being about 12 degrees Centigrade.

Rainfall.—The regular rainy season lasts from May to September, but it rains some during the rest of the year as well, the average yearly rainfall reaching about 560 millimeters.

Sierras.—There are many mountains in the Federal District, the most important of which are: the Ajusco, with its summit of the same name, 3,951 meters high; the Xitle, of 3,100 meters; El Judío, of 3,605 meters; Pico del Aguila, of 3,960 meters; the Maxtlacatepec, of 3,625 meters; the Malacate-

pec, of 4,096 meters; the Quiepil, of 4,088 meters; the Cerro Gordo, of 3,000 meters; the Tuxtepec, of 3,098 meters; the Neapanapa, of 3,280 meters, and many others.

The mountain ridges in the Federal District are of volcanic nature, the most important of them being those of San Angel, Xitle, Venta, Cerro Pelado, Chichinautzin. The peaks of the mountain of Las Cruces are seen on the west side of the City of Mexico, the wonderful panorama of which is enhanced by the view of the Popocatepetl and the Ixtaccihuatl mountains, in the State of Puebla.

Rivers—Lakes.—The rivers in the Federal District are nothing but streams which carry a good deal of water after the heavy rains. Those best known are the rivers San Angel, La Piedad, El Consulado.

The District has several lakes: the lake of Xochimilco, with its arm extending east of Tlahuac, where it joins the Texcoco lake, a large portion of which is drained; the lake of San Cristobal and a few lagoons of sporadic character, appearing only during the rainy season. In the vicinity of Xochimilco and Ixtacalco the lake has been filled in and turned into lawns which are called "chinampas"; they are very well cultivated and supply most of the vegetables consumed in the Federal District. Beyond a point called Tlahuac these lakes are navigated by means of small canoes and flat boats, as are also the various canals.

DURANGO

Climate.—The climate in this State is uniform and mild. On the plains in the center of the State,

the temperature averages 15 degrees Centigrade; in the Sierra it is 10 degrees, and 25 degrees in the big flats of the Bolson region.

Rainfall.—The rains are plentiful and regular in the large plateaus of the Sierra Madre; it rains with regularity in the valleys in the central section of the State (Santiago Papasquiaro, Guadiana, Poanas, Suchil, etc.), while in the Bolson region it scarcely rains at all. The rainy season may be stated as lasting from June to September. The mean precipitation is 550 millimeters.

Sierras.—The Sierra Madre traverses the State of Durango, its highest points being in Durango and its spurs and minor range towards the State of Sinaloa. It is known under various names, according to the places where it is located: Michis, Parrilla, Santa Elena, Rigistro, Mezquital, Pueblo Nuevo, San Dimas, Camarones, Papanton, Candela, San Francisco, Ose, etc. The peaks of over 3,000 meters above sea level are: the Cerros of Papanton and Michis, in Suchil; Cerro Blanco and Cerro del Calvo, in Mexquital; Cerro Prieto and Huehuenté (the latter has snow on its crest the whole year round), in San Dimas; Pico Helado de Muinera, and the Ventoso, Vasitos, Los Reyes, Bufa de Candela, in Santiago Papasquiaro, and the Bufa del Tacotin, Cerro del Papanton and the Cerro de Guanacevi in the same region. The average height of the Sierra Madre is 2,600 meters above sea level.

Rivers.—The most noted rivers in the State are the following: the Nazas, which is the source of the water in the lagoon section and which at its rise is called the Palomas river; it receives the waters of several confluent, such as the Zape, Tepehuanes, Atotonilco, San Juan, etc. The volume of water

carried by this river is not large except when it rains in the Santiago Papasquiaro ranges or at the time when the heavy snowdrifts on these mountains thaw. The Tunal river rises in Tres Molinos, to the west of the City of Durango; it carries a fairly large and permanent body of water, which is considerably added to in the rainy season by the numerous streams emptying their waters into it. After it has received the waters of the Saucedo, Santiago, Bayacora, Poanas and Suchil rivers, it takes the name of the Mezquital river, flowing through the State of Nayarit under the name of the San Pedro and emptying itself into the Pacific Ocean at Bocas del Comichin. The Humaya and Tamazula rivers form the Culiacan river in the State of Sinaloa; the Aguanaul river rises in the State of Zacatecas and enters the State of Durango at various points of San Juan de Guadalupe. The other rivers are: The Chico or Acaponeta, the Baluarte, the Presidios, the Ventanas and others too numerous to mention. Of these rivers the Nazas and the Aguanaval empty their waters in the interior of the State; the others flow into the Pacific Ocean, none of them being navigable, at least within the limits of the State.

There are many waterfalls, as all the rivers have their rise in the higher parts of the Sierra Madre and rush down to the valleys and ravines; those which could be utilized for the construction of electric plants are the falls called the Salto, which has a height of 30 meters and a considerable volume of permanent water, so that there would be no need to construct dams. Such an electric plant could supply light and power to the city of Durango and the towns of Nombre de Dios, Poanas, La Constancia

and others. On the Tunal river a waterfall could be artificially created by damming the water near to the town of Durango, which could be put to the same uses as the above.

Archaeological Ruins.—Among the ruins which are worth visiting and studying are those of Zape, the remains of the Tepehuana tribe, the most numerous of those who at one time inhabited these regions; those of Tuitan, near the Soldado gorge, formed by the Sierras of Maica and La Brena. At Chalchihuites there are important ruins of a town of Toltec origin.

GUANAJUATO

Climate.—As for the climate, the State forms one region; the highest places such as Guanajuato, San Felipe, etc., can be considered as somewhat cold during the winter months. The mean temperature during the year is 18 degrees Centigrade, and the climate of the great valleys of El Bajio and Santiago is justly regarded as agreeable and healthy.

Rainfall.—The rainy season lasts from June to September, its mean annual precipitation being 650 millimeters.

Sierras.—The principal sierras traverse the State: the Sierra Gorda which extends towards the north and the Sierra de Guanajuato crossing the heart of the territory. Both have spurs which are known under different names, according to the section of the country which they traverse, and which, together with the principal mountain ridges, enclose large valleys. The highest peaks are at an altitude of more than 3,000 meters above sea level. The city of Guanajuato is situated in a glen completely sur-

rounded by mountains. In this glen, not far from the city, is the famous reservoir of La Olla, considered by the people as a gift of Providence; it is of gigantic proportion and is a popular place of gathering for the townspeople.

Rivers.—The State is watered by the following rivers: the Santa Maria which forms the border line between this State and that of San Luis Potosi; the Xichu, the Irapuato, the Guanajuato, the Turbio, the Lerma, the Queretaro, the La Laja and the Acambaro; all these are confluent of the Santiago which gathers all the waters from the western section of the Central Plateau. All these rivers could be made to serve irrigation purposes by the use of proper engineering works.

None of these rivers are navigable within the limits of this State, though the Lerma river carries a considerable volume of water.

As many of these rivers come down from high sierras, such as those of Guanajuato, the Sierra Gorda and the Sierra of Queretaro, there are many waterfalls which could easily be utilized for the production of electric energy.

Archaeological Ruins.—In the environs of the town of Acambaro there is a hill on the side of which many archaeological objects are interred, belonging to Tarascan civilization. Near Apaceo there are sepulchres in which a rich farmer discovered a cloak made of plumes, and other objects of great interest and shedding additional importance on Aztec civilization. Ruins of sepulchres exist on the hacienda of Burras, remnants of Tarascan civilization. In the town of Leon there is a spring at the bottom of which lie idols and tripod earthen jars, belonging to the epoch of the Tarascans.

GUERRERO

Climate.—The climate is warm in nearly all the sections of the State, but exceedingly hot on the coasts. In the higher regions, such as Taxco, it is temperate, with a tendency toward excessive heat. The mean annual temperature is 28 degrees Centigrade. It never gets cold during the winter months, while during the summer the heat is unbearable.

Rainfall.—The rainy season lasts from May till October, the mean precipitation being 1,900 millimeters.

Sierras.—The terrain of Guerrero is very mountainous, being traversed in its entire extension by the Sierra Madre del Sur (the main southern mountain range), proceeding from the State of Oaxaca. The different sierras are known by the name of the regions which they cross: the sierra of Ometepepec, that of Tixtla, of Iguala, of Chilpancingo, of Tecpan, of Tlaxco, of Coyuca, etc.; they have peaks of great altitude. The "Puntas de la Tentacion" (the Temptation Peak) is 3,500 meters above sea level; the "Tetas de Coyuca," 3,400 meters. Some of the less elevated sierras have historical significance, such as the Veladero, near Acapulco.

Rivers.—The principal rivers of the State are: El Balsas, which waters the northern and central sections of the State and into which many of the other rivers and streams empty their waters; the river Tlapaneco, the Petatlan, the Atempa, the Atanango, the Tepecoacuilco, the Cocula, the Teloloapan, the Alahuixtlan, the Yoyotla, the Ahuchitan, the Cotuca, the Cutzamala, the river Ometepepec on the border of the State of Oaxaca, the Ayutla, the Atoyac, the Papagayo, etc.

Of these rivers only the Balsas is navigable in its terminal portion over a distance of more than 100 kilometers, though it is not utilized for navigation to the extent it deserves to be. The other rivers are navigable only for vessels of little draught or flat-bottomed craft. There are waterfalls in all the rivers of the State; these could be utilized for the production of electric energy, at short distances from the towns.

HIDALGO

Climate.—The State has two regions: the level country, or "Llanos," which being high enjoys a temperate and agreeable climate; and the Huasteca region which has a torrid climate. The annual mean temperature is 14 degrees Centigrade in the former, and 20 degrees in the latter.

Rainfall.—The rains occur, as a rule, in the months of June to September, the rainfall being very unequal in different parts of the State; for instance, while in Pachuca it reaches 279 millimeters, it is 1,251 in Zacualtipan. It rains a great deal in the towns situated along the banks of the large rivers Moctezuma, Tula, Amajaque and Huejutla, as also in the Tenango section, where not a few of the streams take their rise and later on empty their waters into the general mass of waters at Necaxa, where large water reservoirs have been constructed.

Sierras.—The mountain ranges which traverse the State are part of the Sierra Madre Oriental, and are generally low, although rugged. The mountains of Pachuca, Real del Monte, Sierra de Espana, Sierra de Tenango and others cover the entire State. Some of the mountain ranges are so rugged that the open-

ing of roads, such as that projected to Tampico, has been a serious engineering problem.

Rivers—Lakes—Lagoons.—The rivers of the State are numerous, but we shall mention only the principal ones: Tula, Amajaque, Moctezuma, of which the San Juan, the Estorque, the Tequixquiac, the Cuautitlan and the Tepeji are tributaries. The Mextitlan is a confluent of the Amajaque, and the Huazeazaloya forms the celebrated Regla cascade which we have already mentioned. Many streams take their rise in Hidalgo territory and by artificial means are made to follow a course different from the general course of the valley of the Panuco and empty themselves in the great basin of Necaxa; among these should be especially mentioned the Tenango river, diverted at first by means of a dam and then by a tunnel one kilometer long, toward the Necaxa river.

There are several lakes; that of Nextitlan is very large and was for some time the draining point or interior basin of some of the streams in the State. Like the lakes of the State of Mexico, the Federal District and Michoacan, it is navigable by large and small canoes. In it, as in the beautiful Zirehuen lake, Michoacan, Xochimilco, Xaltocan and others, there are water plants, such as white lilies, also called "ninfa blanca" (*nymphaea alba*), "tule" (*thifa angustifolia*, *syrpus lacustris*), "tulillo" (*cyperus melanos tachys* and *eleocharis palustris*), as well as the reed grass (*arundo donax*), all of which give a delightful appearance to the lakes and lagoons of the high valleys of the country. The Apam and the Tecomulco lagoons are also in Hidalgo, having the same characteristics as far as their vegetation is concerned.

We cannot pass on to other subjects without emphasizing the opportunity available for the construction of a power plant at the Regla waterfall, for the supply of light and power to Tampico and other towns in the neighborhood at a comparatively small cost.

Archaeological Ruins and Sights.—The flats of Apam are celebrated for their magnificent views, in which the “pulque” producing plant, the “maguey,” displays its well-known outlines. The tunnel or canal of Tequixquiac which, crossing the mountain range of that name, joins the Tula river with all streams of the Valley of Mexico, from whence it flows into the Panuco, is partly located in the State of Hidalgo. The valleys of Tula, Tulancillo, Tenango, Amajaque, Hejutla are very beautiful. The Regla waterfall, one of the highest in the country, is located in this State, although up to the present no use has been made of it for the generation of power. The city of Tula was for a long time the headquarters of the Toltec people, one of the first which, originally from Huehuetlapalam, between the Gila and Colorado rivers, emigrated south. For this reason this place is considered of historical interest. Its physiography and the remains, such as they are (though the Toltecs did not construct any buildings of importance at this point) guide the ethnologist and the historiographer in their study of the traits of character of those Nahuatl tribes who for many years preceded the seven tribes formerly inhabiting the Valley of Mexico. There are, besides, places which, owing to the beauty of their landscape could be utilized for the attraction of tourists.

Near Tula Hidalgo there is a hill called “El

Tesoro" on which there are ruins of a town or village and specimens of hieroglyphics cut in the rocks: all of Toltec civilization.

JALISCO

Climate.—The general climate in this State is temperate, although there are diverse regions which differ in climatic conditions. In the south and west of the State the temperature reaches 27 degrees Centigrade, in the City of Guadalajara, 19 degrees, and in Colotlan, 16 degrees.

Rainfall.—The rainy season lasts from June to December, the mean annual precipitation being 1,020 millimeters.

Sierras.—The State is very mountainous in the territory adjoining the States of Michoacan and Colima, where it possesses part of the mountains El Nevado of Colima and the Volcano of Colima, the ravines of Atenquique, Beltran and others; then come several mountain chains known under the name of the sections of the State which they traverse, such as those of Sayula, Autlan, Mascota, Alvarez, Tamazula, Tapalpa, Cocula, San Martin, Yahualica, etc., the terminus of them being within this State; the sierra of Ceboruco, with the volcano of this name and that of Sanganguey. Other sierras of the State are the Comanja, the Colotlan, the Bolanos, the Huejuquilla, etc. Here we may mention the valleys of the State: the most beautiful valley of Atemajac, in which the city of Guadalajara is located, the valley of the Bajio, parts of which correspond to the States of Guanajuato, Queretaro and Michoacan; then there are less important valleys, such as those of Magdalena, Zacoalco, Acatlan, Cocula, Verdia, etc.

Rivers—Lakes—Lagoons.—The principal rivers of the State are mostly part of the water system of the Santiago Tololotlan, which at its upper course goes by the name of Lerma. These rivers are: the Ayo Chico, the Zula, the Verde, the last being formed by the rivers Lagos, Encarnacion, Aguascalientes, and Teocaltiche, the Juchipila, the Tlaltenango, the Bolanos, the Colotlan, the last being formed in the State of Durango by the Verde river and the Barranca del Tabaco, and the Santiago river which on the border line of the State of Nayarit is joined by the river Nechistiltic. In the southern section of the State there are the rivers Armerio and Cithuatlan which empty into the ocean in the State of Nayarit; furthermore, the rivers Ameca, Purificacion, San Nicolas, Tomatlan, Tuito, Mascota, Atenguillo, Tuxcacuesco and Tuxpan. Of all these rivers only the Santiago is navigable over a certain length of its course for small craft, and near its mouth by vessels of larger draught.

The lakes of the State are: the Chapala which is the most noteworthy and beautiful of all the lakes in the Republic, 86 kilometers long and 23 kilometers wide, having a splendid steamer service. At present this most beautiful lake is invaded by water lilies (*eichornia crassipes*), against which serious measures are being adopted. It is claimed that paper could very well be manufactured from this plant, eventually offering an excellent opportunity for an important industry.

The Magdalena Lagoon, near the border line of the State of Nayarit, is a small basin, embedded within the table-lands of the Sierra Madre Oriental, offering wonderful sights; not less beautiful are the

lagoons of Zacoalco, Verdía, Cocula, Acatlan and others.

All the rivers form waterfalls; but none of them is so notable as that on the Santiago river at a point called Juacatlan where it drops from a height of 25 meters, carrying a large volume of water. The rivers Bolanos, Juchipila, Nechistiltic form various falls, the practical utilizing of which would require certain engineering improvements.

Archaeological Ruins.—Along the entire shores of the Chapala lake and in the Cumato hacienda a number of articles of different kinds have been found, relating to the Indian tribe of the Tarascans.

Various objects and a little idol of solid gold, now at the National Museum of Mexico City, were found at Salinas de Zocoalco (Salt works of Zocoalco), all of which belong to Tarascan civilization.

MEXICO

Climate.—The State can be divided into two regions, the south which is in the warm section and the other in the Valley of Mexico, the temperate zone. Although the valley of Toluca is at a considerable elevation above the level of the sea, it may nevertheless be considered as belonging to the temperate zone, in spite of the fact that the temperature here sometimes reaches an extremely low point. The mean temperature in the valley of Toluca is about 13 degrees Centigrade.

Rainfall.—The rainy season makes itself noticeable with regularity from June till September, the mean precipitation reaching 673 millimeters.

Sierras.—The State of Mexico is rather mountainous, some parts being very high. The mountain

regions of Toluca, Ajusco, Nevada, Las Cruces, Monte Alto, Monte Bajo, Tepozatlan and Espana are among those worth mentioning; these form the principal and most beautiful valleys of the State. The highest peaks are the Popocatepetl, 5,462 meters above sea level, and the Ixtaccihuatl, 5,382 meters, both being situated on the border line of this State with the State of Puebla. Then there is the El Nevado de Toluca in the Toluca Valley with an altitude of 4,578 meters, the Ajusco in the mountain region of the same name and situated on the boundary line with the Federal District; other high peaks are the Tlaloc, Telepan, Sincoque, Xoloc, Paula, Cerro Gordo.

These mountain regions, together with those of Sultepec and Zitacuaro in the south form three important valleys; the Valley of Mexico, noted for its wonderful panorama, the Valley of Toluca, one of the highest in the country and rivaling that of Mexico in beauty, and the Bravo Valley in the south. All of these offer sights well worth seeing by tourists. The Volcano of the Nevado de Toluca presents in its higher portions some very attractive views among which is to be mentioned the marvelous lake in its main crater. The Ixtaccihuatl has the aspect of a white woman resting on her back. The Popocatepetl, still active, is famous for its beauty.

Rivers—Lakes.—The rivers of the State are: the Lerma in the valley of Toluca (called Santiago Tolotlan); the Bravo, irrigating a very productive soil, the Sultepec, the Temaxcaltepec and others. Numerous rivers, besides those mentioned, empty themselves into the different lakes of the State.

The lakes situated in the State of Mexico are indeed very picturesque; Texcoco, the old Chichi-

mexan Capital, which was famous for its baths during the times of Emperor Netzahualcoyotl, abounds in marvelous sights on the shore of the lake bearing the same name. The Texcoco lake is almost completely drained by means of the great Desague Canal. The lake of Xochimilco has been converted in its larger portion into artificial meadows, called "chinampas," and known to be very fertile. Then there is the lake of Zumpango, the lake of San Cristobal, the lake of Chalco, almost entirely drained, the Xaltocan lake and a few others of minor importance. All these lakes are rather large and navigable for canoes or flat boats which can carry more than fifty persons. In the Valley of Toluca most picturesque lakes and lagoons are to be found, as, for instance, that in the main crater of the Nevado Volcano, already mentioned.

The rivers in the southern section of the State have waterfalls which can be exploited for the production of electric energy.

Archaeological Ruins—Sights.—Not far from Texcoco, on the way to Puebla, the attention of the traveler is drawn to the pyramids of San Juan Teotihuacan, visited by tourists and students of archaeology. These ruins are remains of a Toltecan or Totonacan civilization which had existed in the Valley of Mexico centuries before the Nahuatlacan tribes inhabited that valley; these pyramids can very well be compared with the famous structures of Egypt. The ruins of the convent of Tepozotlan are also noted for their beauty, and the church is considered a magnificent work of art. The structure of the Canal de Desague is likewise noteworthy; this applies also to the ancient canal of Hehuetuca, where a centuries-old tunnel can still be seen.

At Calixtlahuaca there are the ruins of a town which was built on a hill; in this hill objects of gold, silver, copper, crystal rock and amethysts have been found buried. At this same place, some years ago, a silver armor plate was discovered, with engravings of eagle plumes, and alongside of this plate there was a golden diadem, all belonging to pre-Cortesian times. On the top of the hill there was also found an idol representing the body of a woman, the head being a skull crowned with small human skulls. All these relics of Matlancincan civilization are kept at the National Museum, City of Mexico.

At Jilotepec there is the large base of a teocalli, on top of which a Catholic church has been erected. Other ruins found within the territory of this State, as well as of other States, are indicated and explained in an appendix at the end of this book.

MICHOACAN

Climate.—The climate of the State can be divided into two zones: that of the Southern Plateau and that of the Central Plateau. The climate in most of the Central Plateau is mild and agreeable, with a tendency toward warm temperatures, the mean annual temperature being 18 degrees Centigrade. That of the Southern Plateau is extremely hot, the average being 30 degrees, and prevails in the region to the south of the Volcanic Axis of Mexico, formed by various mountain ranges. Rain is very abundant and falls nearly the whole year round, it being very easy in the Southern Plateau to obtain three crops per annum.

Rainfall.—The average yearly precipitation on the Central Plateau is 935 millimeters. The months

during which it rains with greatest frequency and in largest quantity are from April to October.

Sierras.—The principal mountains of the State are: the Volcanic Axis (El Eje Volcanico), formed by the mountain ranges of Jiquilpen, Maravatio and Zitacuaro, consisting of very rugged sections, in which there are various volcanoes, such as the Pico de Tancitaro, El Tatambou (the first mentioned is 3,365 meters high and the second 3,754 meters above sea level); the Jorullo volcano, located in a low section, and constituting the volcanic region known under the name of Los Hornitos, composed of a number of volcanoes rising only a few meters above the level of the ground. The Pico Helado de Quintos is fairly high. The State possesses innumerable mountain ranges, full of precipices which have made the construction of railroads extremely difficult.

Rivers—Lakes.—Of the numerous rivers of the State of Michoacan we mention the following: the Lerma, which separates it from the States of Guanajuato and Jalisco; the Zitacuaro which joins the Cutzamala, the latter uniting with the Balsas which forms the boundary line between the States of Michoacan and Guerrero; the latter part of this river is known under the name of Zacatula and enters the Pacific by several mouths. Several other rivers in Michoacan unite with the Las Balsas river, as, for example, the Tacambaro, the Tepalcatepec, the Cuapatitzio, the Rio del Marques and the Apatzingan. The Duero river empties itself into the Chapala lake. On the boundary line between the States of Michoacan and Colima there is the Cohuayana river which flows into the Pacific Ocean.

Many of these rivers are large, and the Zacatula

is navigable for many kilometers for vessels of moderate draught.

The lakes of Michoacan are famed for their beauty. First to be mentioned is the lake of Chapala, which belongs in part to this State and which is the favorite Spring resort of a number of families from the City of Mexico, Guadalajara, Morelia and other parts of the Republic. The views on this lake are delightful. The charming lake of Patzcuaro which was in former times the headquarters of the Tarasca tribe, is of some depth and is therefore navigable. In the center there is an island on which there is a small town called Janiche which subsists entirely by fishing. On the shores of Patzcuaro rise the ruins of the ancient Tarascan capital, Tzintzuntzan. The lake of Cuitceo is shallow and scarcely navigable. The Guadalajara Railroad runs along its shores, offering most attractive views. There are still other lakes in the State, such as the Tinguindin, the Tanguancicuaro, the Cotija, the Zipimeo, the La Guarachita and La Piedad. Among the various lagoons may be mentioned one in the neighborhood of Querendaro, which has good saltpans operated by the Compania de Salinas de Penon Blanco of San Luis Potosi. Both the lake of Chapala and that of Patzcuaro are navigable for many kilometers.

Waterfalls are plentiful in the State of Michoacan, but we shall mention only those which could be utilized for generating power at small cost. There is first of all the beautiful waterfall of Zararacua on the Cupatitzio river, near Uruapan, and at which there is to be located an electric power plant which will give light and power to Morelia, Uruapan and other towns. The falls of Zirizicuaro, near the hacienda of this name and the Balsas carry a large

volume of water, although not to be compared with the Zararacua falls, but much superior to the celebrated Necaxa waterfall. The fall between Zamora and Villachuato is being utilized by an electric power plant which supplies power and light to Guanajuato, Zamora and other towns. Waterfalls can be constructed on many other rivers of the State.

Archaeological Ruins.—The ruins of Tzintzuntzan, the ancient capital of the Tarascan tribe, are well worth visiting. The Hornitos region, the small island on the Patacuaro lake and many other places in the State of Michoacan offer strikingly beautiful views. At Charan there are ruins of Tarascan buildings. At Paracho there are remains of edifices and sepulchres, and near Patzcuaro quantities of diverse objects are buried in small sepulchres, all of which are of Tarascan origin. At Tanguanzicuaró, five leagues from the City of Zamora, Tarascan sepulchres and ruins of buildings are found.

MORELOS

Climate.—A hot climate prevails in this State, so much so that at times it is almost unbearable, reaching an average of 28 degrees Centigrade.

Rainfall.—Rains are abundant and fall regularly from May to October. The average annual precipitation is 2,600 millimeters.

Sierras.—This State is extremely mountainous, the principal sierras being those of Huizilac, Tlaltizapan, Yautepec, Popocatepetl, Ajusco, Totocala. Some of the altitudes exceed 3,000 meters above sea level, as for example, the peaks of Ocoxchio (3,296 meters), Cuahuatzalo (3,280 meters), Cerro de las Palomas (3,350 meters). There are other high

summits such as the Cerro de la Media Luna, the Otlayucan, and others.

The valleys worth mentioning are those of Cuernavaca, one of the most beautiful valleys of Mexico, the valley of Cuautla, also exceedingly picturesque, and the valleys of Yauatepec and Plan de Amilpas. These valleys are frequently points to which excursions are made.

There are wonderful places, especially in the vicinity of the city of Cuernavaca, in itself a garden-like region, well worth visiting by tourists.

Another of the frequently visited places, considered a marvel of Nature, is the Grotto of Cacahuamilpa: large galleries profusely adorned with stalactites and stalagmites, the artistic arrangement of the various sections, its size and its imperishable beauty excite the admiration of the learned as well as of the ignorant.

Rivers—Lakes.—The rivers of the State carry a fairly large volume of water which in the open plains is utilized for the irrigation of sugar and rice plantations. The rivers Yauatepec, Cuautla and Tetecala empty themselves into the principal river of the State, the Amacusac, the chief artery of Morelos.

The State has two fairly large lakes, the Coatehelco and the Tequesquitengo. The rivers and the lakes we have named are navigated by motor boats, canoes and barges which carry the cane to the sugar mills at a low cost.

Since the large confluent of the Amacusac river come down from high sierras, they form numerous falls which can easily be enlarged by means of reservoirs and utilized for the generation of electric power. It would be greatly advantageous to the State of Morelos to have its most important places

connected by electric railways, all the necessary power for which could be developed at the above waterfalls. The rivers Cuautla and Yautepec have also good waterfalls carrying a sufficient volume of water. The establishment of the industries of which we have made mention in another chapter would necessitate the utilizing of these falls for the production of electric power.

All this will certainly be done as soon as industrialists undertake the development of all the great natural resources of the State, instead of confining all their efforts, as is the case at present, to the production of sugar-cane.

Archaeological Ruins.—The following ruins are found in the State of Morelos: those of Xochicalco, at a distance of some twenty-four kilometers from the city of Cuernavaca, constructed on a hill which has a circumference of four kilometers. Immense ditches had been dug around this hill, thus creating a completely isolated and inaccessible peak on which a massive and rough palace was constructed of which there is one story left up today; tradition has it that there were originally five stories to the structure. The Pyramid of Tepoxtlan is another remnant of past civilizations, so remote that nothing is left to indicate their nature, characteristics and trends, except the ruins that are found in the State. It is hoped that all such remains will be studied in the future as the result of a stronger stimulus in the matter of archaeological excavations and investigations. Ruins of edifices belonging to the Aztec period are found at Atlacahualayan. At San Anton, a suburb of the city of Cuernavaca, there is a sculptured rock showing an alligator and four points. At the farm of Basoco, nearly within the limits of Cuernavaca, there

is a rock with a relief representing a standard, five darts and what seems to be the head of a tiger. Another rock near Cuernavaca shows the relief of an eagle, all of this being remains of ancient Aztec civilization. Rocks on which immense idols have been sculptured by the Aztecs are found at or near Yantepec.

NAYARIT

Climate.—A hot climate prevails along the coasts of this State, the temperature reaching an annual average of 28 degrees Centigrade. In the high regions, such as that of Santiago Ixcuintla and the sierras, the climate is temperate and even cold, with frequent snowing in the months of December, January and February; in this region the mean temperature during the year is 10 degrees.

Rainfall.—The rains are quite regular in this State; they usually fall during the months from June to September, the mean annual precipitation being 840 millimeters.

Sierras.—The Sierra Madre Occidental (the great western mountain chain) traverses the State from south to north, having several considerable spurs, such as the Sierra of Ceboruco, that of El Tigre, the Sierra of Nayarit, and the Sierra of Alica, notable in the history of Mexico as the stronghold during the wars of Independence, of Lozada, called the Tiger of Alica. Among the notable peaks are the Volcano of Ceboruco and the summit of Sanganguey, both of which belong partly to the State of Jalisco. The sierras in this State reach an altitude varying from 2,500 to 2,600 meters above the level of the sea.

The State offers wonderful sights, the most fam-

ous being the so-called "Puerto de Pimeras Guerras" (Ports of the First Wars), located between the Sierra of Nayarit, belonging to this State, and that of Huazamota, in the State of Durango.

Rivers.—The rivers of the State of Nayarit are: the Santiago or Tololotlan, navigable for some kilometers; the San Pedro river, called Tunal at its rise, and Mexquital in the State of Durango; also the river Acapone, called Rio Chico in the section belonging to the State of Durango. All these rivers carry a large body of water, being sufficiently deep up to within several kilometers from their mouths to permit navigation by small craft.

NUEVO LEON

Climate.—A mild climate prevails in this State, although in some places, as, for instance, in the city of Monterrey, it is extremely cold in the winter, and unsufferably hot in the summer. The climate is temperate in the towns of Linares, Lampazos and in other places. The mean annual temperature is 17 degrees Centigrade.

Rainfall.—The rainy season lasts from June to September, the average precipitation during the year being 290 millimeters.

Sierras.—The territory of Nuevo Leon is traversed in the direction of its greater extension by the Sierra Madre Oriental, the notable spurs of which are the sierras of La Iguana, Santa Clara and Papagallo. The principal peak is that of La Silla, not far from the city of Monterrey, which has an altitude of less than 3,000 meters above sea level.

Rivers.—The rivers of this State are the following: the upper course of the Conchos river, the

rivers San Juan, San Lorenzo, Potosi, Camacho, Linares, Pablito; then there are the streams Ane-gados, Pomona, Venadito, which, with the exception of the San Juan which flows into the Bravo river, are tributaries of the river Conchos, or of the San Fernando in the neighboring State of Tamaulipas. The rivers Salado, Sabinas, Pesqueria, Pilon, Saltillo, Palmar, Salinas and Tinajera empty themselves into the Bravo.

A few lagoons of no importance exist only during the rainy season. None of the rivers we have mentioned is navigable within the limits of this State.

The waterfalls formed by some of the rivers which come down from the Sierra Madre Oriental could be utilized only by means of costly engineering works.

Archaeological Ruins.—Near Piedras Pintas in the steep rocks of the mountain there are stone images redating back to Tarascan civilization.

OAXACA

Climate.—The prevailing climate is a warm one, it being exceedingly hot in the Tehuantepec section, where the mean annual temperature is 27 degrees Centigrade. In the Valle de Oaxaca it is also warm, though the climate is much milder than in the coast section; the temperature averages about 17 degrees the year round.

Rainfall.—The rains usually begin in May of each year and end in September, the mean average precipitation being 900 millimeters.

Sierras.—The State of Oaxaca is extremely mountainous; in this section the mountain system of Villa Alta rises from a single nucleus called, in the poetic

and complex language of the primitive inhabitants of that section, "Zempoatepetl," meaning "twenty mountains"; this was the name by which they designated this group of mountain ridges. The highest peak of this group, that is to say, the real "Nudo del Zampoaltepetl," is 3,400 meters above the level of the sea. From the crest of this peak the two seas can be seen; the Pacific Ocean and the Gulf of Mexico. From there starts the Sierra Madre del Sur which extends to the State of Chiapas, becoming much lower before reaching the Isthmus of Tehuantepec, then again rising gradually till it joins the "Nudo de los Altos" (the Knots of the Heights) or "Nudo de Quetzaltenango" in the Republic of Guatemala. Towards the north there stretches a chain of mountains which to a certain extent run parallel with the Gulf of Mexico and join the volcanic central system at what is called the "Pico de Orizaba" (the Peak of Orizaba), in the State of Veracruz; on the West, there is a chain which is called "the Sierra Madre del Sur" (southern main mountain chain) in the States of Oaxaca, Guerrero and Michoacan, and "Sierra Madre Occidental" (western main mountain chain) from the State of Colima onwards; it is much loftier than the eastern chain, although not so steep. A large number of spurs emanate from this range within the State, of which may be mentioned the Mixtecas mountains, those of Ixtlan, etc. Among the most notable peaks may be named the Cerro de la Culebra (the Peak of the Snake). To give a list of the various summits would be a laborious task which we do not think would be of any practical value.

Rivers—Lakes—Lagoons.—Because of the nu-

merous mountains, there are a number of large rivers in Oaxaca, some of which flow into the Gulf of Mexico, while others flow into the Pacific Ocean. Those which flow down towards the Gulf of Mexico are, the large river Papaloapam, the San Juan (which finally becomes a tributary of the Papaloapam itself) and the Coatzacoalcos, which empties its waters into the sea at Puerto Mexico. Those which flow into the Papaloapam are: the Hondo river, the Rio de las Vueltas (the zigzagging river), the San Antonio, the Tehuacan, which comes from the State of Puebla, the Tonto, the Quiotepec, Trinidad and La Lama; those which join the river Coatzacoalcos are the Chichihua, Almoloya, Citune, Bachina, Mocone (the latter two form the Malantango river), the Sarabia, Tortuguero, Jumuapa and the Xaltepec. The San Juan has numerous confluent. The Tehuantepec river empties itself into the Pacific Ocean at the Bar of Ventosa. The rivers which join the Balsas river are: the Mixteco, which separates this State from the State of Puebla, the Mixtepec, the Juxtlahuaca and the Coixtlahuaca. Lastly there flow into the Pacific the Verde or Atoyac river, on which the city of Oaxaca is situated, and the Ometepec.

There are a few lakes and lagoons in the upper basins formed by the mountain ranges; at San Pablo Guelatao there is a very beautiful lake and a number of lagoons, although some of the latter are very small. As far as this State is concerned, the rivers on the Pacific side are the only ones navigable by barges and small steamers.

All the rivers form waterfalls little known up to the present, and which never have been made use of. On the Rio Verde one or two falls especially could

be utilized for furnishing power and light to the City of Oaxaca on a larger scale than is the case at the present time; the latter has an electric street and suburban car service. The rivers which flow towards Veracruz have good waterfalls, the Quiotepec being one of those which has the largest number of such falls.

The spinning and weaving mills, the smelting works and various other established industries, or industries to be established, would be greatly benefited by the use of electric power.

Archaeological Ruins—Sights.—There is the Valley of Oaxaca or of Antequera, also called the Valle del Marques (the Marquis valley) in memory of the celebrated "conquistador" don Hernan Cortes, a knightly figure which would appear to have been taken out of a daring novel, and whose immense "marquisate" estate was located in this neighborhood. At a time antedating these historic associations, Oaxaca possessed a civilization which has always attracted the attention of the historians. It was, so tradition says, colonized in pre-Cortesian days by Indians who had come from Tameachan, today called Tamaulipas. The first cities were founded in Teotitlan del Valle and Teotitlan del Camino, where the Capital Zaachilango was built, it being the place where the Emperors of the Indians lived, up to the last one, during whose reign the territory was conquered. The name of this emperor, around whom many of the beautiful legends of the Oaxacans have grown up, was Cisijoesa. At the same time a son of the latter, named Cosijopi, was emperor in Tututepec, today called Tehuantepec (Tehuantepec, which in the vernacular, signifies "Tiger Mountain"). The famous ruins of Mitla,

near which grow the giant "pitahayos" (*cerus variabilis*), are located in this State. These ruins, which are attributed to "Palencanan" races, testify to the high stage of civilization attained by these pre-Cortesian peoples. There are also the Monte Alban ruins. One of the historic relics which is most esteemed by Mexicans, the house where don Benito Juarez, a very prominent figure in contemporary history, was born, is located in a town of Ixtlan, called San Pablo Guelatao, a section inhabited by the Tzapotec race.

In this State there is an object which has attracted a great deal of attention and which may be considered one of the marvels of Nature; we refer to the gigantic tree known by the name of Arbol de Santa Maria del Tule, which is said to be more than 2,000 years old, still in perfect condition and with probabilities of living for many years more. Its scientific name is "*taxiodum macromatum*." It appears that the village where this tree has flourished so long (Santa Maria del Tule) took its name from the large quantity of "tule" (*thipha dominguensis*) which grows in its lakes.

At Cerro de Guingalo there are large ruins of Guavan civilization; ruins of sepulchres at Coixtla-huaca belonging to the Mixtecan period; ruins and sepulchres of the same origin at Cuicatlan; temples and sepulchres of Zapotecan origin at Etla; also at Huitzo; many sepulchres of Toltecan origin at Los Cues; many important ruins around Mitla belonging to Toltecan and Zapotecan civilization; ruins of a large Mixtecan town at Nochistlan; ruins of Tapotecan edifices at Ocotlan; very interesting ruins of Toltecan origin at Quitopec; other ruins of the same origin at San Carlos; ruins of a very ancient

Mixtecan town at Tecomavaca; groups of temples and teocallis at Zachila, Cuilapa and Xoxo, also at Ginatlan, all of Zapotecan origin.

The State possesses a most beautiful natural scenery, which enraptures most all tourists.

PUEBLA

Climate.—The State possesses diverse regions, in some of which an extremely hot climate prevails; in Chiautla the mean temperature during the year is 23 degrees Centigrade, and 13 degrees in the high table-lands of the State, which means to say that here the climate is temperate.

Rainfall.—The rainy season starts in June and ends in September. The average precipitation varies according to the regions: in the City of Puebla it reaches 815 millimeters; in Chignahuapan, 680 millimeters, in the deep valley of the Necaxa it exceeds 1,200 millimeters, and so on in other sections, such as the Mixtecas.

Sierras.—The sierras of the State are numerous and many of the spurs of the Zempoaltepetl of Oaxaca belong to them. The principal sierras are: the Sierra of Mixtecas towards the south, part of which belong to the State of Oaxaca; the Sierra of Zacapoaxtla, the Sierra of Tlaxco, the Sierra of Monumentos; the Sierra of the Nevada, on the border line of the State of Mexico. In this Sierra are located the famous mountains Popocatepetl and Ixtacihuatl, more than 5,000 meters above the level of the sea. In the Sierra of Tlaxco there is the Matlalcueyatl mountain, also called Malinche, on the sides of which arises the Atoyac river. This mountain reaches more than 4,000 meters above sea level.

Rivers—Lakes.—Numerous rivers water the State. The principal, though not the largest, is the Necaxa river which renders the greatest service to industry. This river has many tributaries, the principal of which is the Huauchinango which has a waterfall not yet utilized. In the neighboring State of Hidalgo the Necaxa, which formerly emptied its waters into the Panuco river, now flows into the Tenango, having been improved by means of dikes and a tunnel 2,000 meters long constructed by the powerful Necaxa Company. The pond of the dammed-in waters, built in order to gather the necessary volume of water, occupies the space of three villages which the Company had had to buy: Necaxa, Patoltecoyo and San Miguel. The principal pond or lake is 37 meters deep and is frequently navigated by large motor barges. The water is brought to the turbines by means of large steel tubes, at about 440 meters below the curtains, in a large ravine.

The Tuxpan river, as well as the Tecolutla, the main course of which is within the State of Veracruz, rises in the State of Puebla, in the Sierra of Huauchinango. The Atoyac, the principal river of the State, is formed by numerous streams rising at the foot of the Matlalcueyatl of the Sierra of Tlaxco; it runs through the valley of Puebla and several of its towns. It carries water enough to allow navigation by means of canoes and small motor boats, for a number of kilometers from the City of Puebla. The rivers Acatlan, Xolochita, Petlalcingo empty their waters into the Mixteco river running along the border line of the States of Puebla and Oaxaca; all these rivers united are then called the Mezcala river, navigable for small craft over its entire course. The State has also the rivers

Tehuacan, Molinos, Acatlan and Tlapaneco, the latter flowing along the border line of the State of Guerrero.

Archaeological Ruins.—The following archaeological ruins are found in this State: at Aguascalatlan there are different ruins the ethnological significance of which is not known.

At Atlixco, in the hacienda of Concepcion, there is a sepulchre and the bases of a temple, representative of the Toltec period.

At Coxcatlan there is a monument known as Sansoanchi. Some curious visitors discovered in it an earthen jar containing finger rings, ear-rings, beads and idols, all of solid gold and exquisite workmanship, and bearing marks of Toltec civilization.

Representative of the same civilization are the platform and the bases of a temple and the ruins of various edifices in Cholula.

Teocallis (that is, Mexican, or generally Aztec temples, built upon truncated pyramids) and sepulchres are found in the hacienda of Guadalupe, in the District of Huejotzingo; they are representative of Huejotzincan civilization.

Diverse ruins characteristic of the Aztec civilization are found in Tecamachalco. To the same civilization belong the ruins of a city on the slope of the mountain, known under the name of "Old Tepeaca." Several ruins at Tlacotepec are of Aztec origin.

Remains of an ancient town at Zoquitlan are representative of Toltecan civilization.

QUERETARO

Climate.—The climate of this State is identical with that of the State of Guanajuato. Both being

situated on the Central Plateau, on both sides of the watershed which divides the deep valleys of the rivers Panuco and Lerma, they enjoy the same mild climate, the same conditions of the soil and identical meteorological phenomena. The temperature of the section called Bajío is on the average 16 degrees Centigrade; that of the plains of Cazadero, although considered somewhat colder, is about the same.

Rainfall.—The regular rainy season lasts from June to September, the mean annual precipitation being about 640 millimeters.

Sierras.—On its border line with the State of Guanajuato this State is traversed by the Sierra Gorda, which is the ridge dividing the above-named deep valleys. This Sierra has several spurs, the sierras of Cadereyta, Toliman and Pinal, those of Queretaro, of Tequisquiapan, etc. The principal summits reach an altitude of 3,000 meters above sea level.

Rivers.—The rivers Estorax, Santa Maria, Toliman, Huilmilpan carry their waters to the Panuco river; the Queretaro, crossing a number of ravines, flows into the Lerma river. None of these rivers is navigable. Waterfalls improved by engineering work could be built for the generation of electric power, since the rivers flow down the Sierra, passing through narrow gorges which could be easily utilized.

Archaeological Ruins.—At Pueblito, near Queretaro, a Catholic church has been built on the base of a teocalli which belongs to the Aztec civilization.

At Ranas, Canoas, in the Sierra of Queretaro there are ruins of edifices of the Aztec period.

QUINTANA ROO

Climate.—The climate in the Territory of Quintana Roo is entirely tropical and consequently quite hot during the whole year, with the exception of the winter months; indeed the temperature drops considerably during the months of January, February, November and December under the influence of the Norther. The hottest months in the year are May, June, July and August. The average temperature is 26 degrees Centigrade.

Rainfall.—The months of June, July and August comprise the rainy season. The average rainfall during the year reaches 808 millimeters.

Sierras.—The mountain range of the Sierra Madre enters the Quintana Roo Territory from Yucatan, District of Maxcanu, crossing it from the Northwest to the Southwest, and dividing the Territory into two equal parts. Nowhere is there an elevation higher than 300 meters.

Rivers.—The only rivers partly watering this Territory are the Rio Hondo (deep river) bordering the British Colony of Belize and navigable for vessels up to 15 tons as far as a point called Las Bocas; then there is the Rio Azul (blue river) serving as the border line between Quintana Roo and the Republic of Guatemala; it is shallow throughout its course.

Archaeological Ruins.—The ancient Maya ruins found in the Territory of Quintana Roo give splendid testimony of the relatively high civilization of its original dwellers, dating as far back as five centuries.

In a place called Chumul there are ruins of several edifices. The ruins of Tulum and El Meco are

found on the eastern coast. The ruins of El Meco represent the base of a temple built of stone and lime. At Elemax there are ruins of several buildings.

On the island of Cozumel are the ruins of El Cedral, Punta Molas, Castillo del Real and Cinco Puertas. Unfortunately no roads lead to these sacred places of tradition and history, given over entirely to oblivion and an exuberant tropical vegetation.

SAN LUIS POTOSI

Climate.—The State has a most diversified climate: in the Huasteca section there is the torrid climate, in some parts almost unbearable, it being the cause of much sickness and of many diseases which are peculiar to this region; in the central valleys or plains the climate is temperate; such is that of the beautiful city of San Luis Potosi. It is cold, and even excessively so, in the great valley of the Salado, where winter is severe, the inclemency of the weather being enhanced by the bareness of the western plains with their sparse and sickly vegetation and an almost rocky soil. In the Huasteca region the temperature has a mean annual average of 28 degrees Centigrade, in the center, 13 degrees, and in the Salado region 8 degrees.

Rainfall.—The rains are very abundant in the Huasteca section where the annual precipitation is not less than 600 millimeters, the rain falling practically throughout the year, with slight irregularity. In the central valley it is normal, the rainy season lasting from June to September, with an average rainfall of 450 millimeters; in the Salado section it scarcely ever rains, except occasionally in the months of July and August.

Sierras.—The State is crossed in its eastern portion by the Sierra Madre Oriental which, although rather low, is extremely broken. The State has in this section only two peaks, the Tancanhuitz ridge and that called Tamazunchale. In the center is the Sierra of Guadalcazar which is rather high. In Matehuala and Cedral the mountain peaks are of considerable elevation, and the road from Vanegas to Matehuala is celebrated for the precipices which are situated at the very foot of the railroad track. The average height of the mountains in the Huasteca section is less than 2,000 meters; those in the center exceed 2,000 meters, and in Matehuala they exceed 3,000 meters.

Rivers.—There are numerous rivers in the State, of which we shall mention only the Santa Maria, the Moctezuma, the Rio Verde, the Tempaon, the Tamoan, the Huejutla, which join the Panuco, which is navigable near the boundary between the States of San Luis and Tamaulipas. The other rivers have a large body of water, but are only navigable by canoes and lighters. The eastern section is well watered, although in the lower portion of the Huasteca section the water is said to be unfit for drinking purposes. In the center, a large dam at Colimoto is planned; in San Luis there is the dam of Mezquitio. There are artesian wells on many estates: Gogorron has fourteen, Jesus Maria has five; Bledos two; La Pila two, and so on.

The principal waterfalls in the State are: the Salto with a large body of permanent water over 300 feet high, near the town of Ciudad del Maiz, and which would be sufficient to supply a much larger amount of electric energy than do the celebrated falls of Necaxa, serving San Luis, Tampico, Mon-

terrey, Aquascalientes, Saltillo, Zacatecas and many other towns.

Sights.—The landscape is worthy of the interest of the tourist. The Salado district represents a vast and interminable, gray plain; with clouds of whitish dust imparting its color to the shrubs which thrive here miserably; here and there are little pools of brackish water. In the center enchanting landscapes, cultivated flatlands, beautiful valleys. In the Huasteca section; luxuriant vegetation, the virgin forests, ravines covered with woods. Among the places the tourists should visit are the San Jose dam, in San Luis Potosi, at no very great distance from Morales, where are the blast furnaces of the San Luis foundry, in every respect worthy of the attention of the tourist; the hacienda of Angostura; that of Gogorron with its fourteen splendid artesian wells; Santa Maria de Rio, on account of its beautiful views; the same refers to Rio Verde, Ciudad Fernandez and, in general, to all the towns of the eastern section of the State. Among the natural marvels we should mention El Salto, in the immediate neighborhood of Ciudad del Maiz, and the "Puente de Dios" (God's Bridge) at the same place. The caves of Guadalcazor are worth visiting.

SINALOA

Climate.—This State has two different regions: the coast and the highlands bordering the Sierra Madre Occidental, the summits of which correspond to the State of Durango. The climate is hot along the coast, the average temperature during the year being 28 degrees Centigrade, and 19 degrees in the rest of the State.

Rainfall.—The rains are abundant: they last from June to September and yield a mean annual precipitation of 980 millimeters.

Sierras.—Several of the spurs of the Sierra Madre reach the State of Sinaloa, being known under the name of the region they occupy, such as Rosario, Union, Cosala, etc. The highest plateau is that of Mesa de Las Hormigas.

Rivers.—The principal rivers of the State are: the Fuerte, the Sinaloa, the Culican formed by the confluents of the rivers Humaya and the Tamatchala or Tamazula, the Elota, the Piaxtla, the Rosario, the Altata, the Topolocampo, the Sacramento, the Baluarte, the Presidios, the Las Canas. Nearly all these rivers are navigable to the extent of some kilometers, all having waterfalls which could be utilized for industrial purposes.

Sights.—The variety and beauty of the landscape observed from the roads which lead to the different towns and settlements of the State are really enchanting, especially the landscapes called the “caidas” (falls), that is, those situated just between the ocean and the Sierra Madre, whence the far-off ocean can be seen. The port of Mazatlan is very beautiful, the point called “Las Olas Altas” being worth while visiting.

There are no pre-Cortesian ruins in this State. It is said that where the town of Culiacan exists now, there was in ancient days the center of the Opatan tribe, which spread all over this State and that of Sonora; the place was then called Huiculuacan, although some historians claim that the settlement's name was Culuacan, later converted into Culiacan, and that the river of this name was then called Petatlan, on account of the huts being built

of mats or "petates." It is said that at this point the Spanish Conqueror Nuno Beltran de Guzman divided his expeditionary army; one section continuing its march towards the Gulf of California, and two other sections following the two arms of the river Petatlan: the river Humaya and the Tamachala, today Tamazula.

SONORA

Climate.—The climate in the State is variable, warm and even hot along the southern coast and on the central and northwestern shores; it is temperate in the center of the State and cold in the Sierras. The mean temperature on the coasts is 29 degrees Centigrade, 19 degrees in the central regions, and 10 degrees in the mountains.

Rainfall.—The regular rainy season lasts from June to September; the precipitation varies very much, for it rains a great deal in the sierras, where snowing is not a rare occurrence, and very little in the desert region of the northwest. Two hundred and eighty millimeters is about the average precipitation in this State.

Sierras.—The State is very mountainous in its eastern section, the central part possessing some important spurs. The Sierra Madre Occidental is the principal watershed, spurs of which are the important sierras of Alamos, Ures, Moctezuma, Magdalena, Cananea, etc. There are some high summits such as the volcano of Babispe.

Rivers.—The principal rivers are: the Yaqui which carries plenty of water and is navigable for about 50 kilometers, as far as Torin; on the southern bank of this river a large canal has been built

by the Sonora and Sinaloa Irrigation Company; this canal extends over 67 kilometers, being 45 feet wide at the upper edge and 35 feet at the bottom, and 9 feet deep. On the northern bank of this river another canal has been built, as large as the first, from which several other canals branch off, as for example, the Marcos Carrillo Canal; the Guamuchil Canal is as large as the others and waters a large area of irrigation land. The Yaqui river is navigable for good-sized vessels as far as the little town of Potam, 35 kilometers from the seashore, and as far as Torin for sailing vessels of small draught.

The river Mayo, which rises in the region of Pinos Altos and Yoquimbo in the State of Chihuahua, runs in a steep bed as far as Conicarit; not before it reaches the hacienda of Tres Hermanos can its waters be utilized for irrigation purposes, but higher up a number of reservoirs have been built, such as those of Santa Barbara, Camoa, Tecia, Los Pobres, Navajoa, Rosales, Jupateco, Tiriaco-huaza, several canals starting from the river, as in the case of the Yaqui river, as, for example, the San Pedro Canal and the Independencia which water a large area of land.

The other rivers are the Altar, the Magdalena, the Sonora, and a number of confluent of these and the first-named rivers.

Sonora is probably the State that has best realized the necessity of irrigation, turning to good account its many rivers for that purpose.

Since all these rivers rise in the high plateaus of the Sierra Madre Occidental, they form a number of waterfalls which are partly utilized. Many others could be artificially created by means of engineering works.

Sights.—The State has the most beautiful landscape, especially in its mountainous sections. There are no ruins in the State belonging to past civilizations, although the regions of this State are near to those which are regarded as the land of origin of the Hueytlapanecan tribe that built the city of Huehuetlapallan at the point of confluence of the rivers Gila and Colorado, whence they emigrated southwards. At Zahuaripa there are grottoes, the origin of which is not well known.

TABASCO

Climate.—The prevailing climate in the State, which is absolutely uniform is hot; it is not a healthy one, as malaria is endemic to the region, and epidemics find a favorable place here. The mean average temperature is 18 degrees Centigrade.

Rainfall.—Rain falls almost the entire year; precipitation registers on the average from 2,000 to 3,000 millimeters per annum.

Sierras.—There are no mountains in the State. A few hills found in this region of the Republic do not deserve attention.

Rivers—Lakes.—The large rivers are the Usumacinta and the Grijalva, into which almost every local river empties itself. The Palizada river has its origin in the State of Tabasco, and empties its waters in the State of Campeche. In fact, the numerous and important streams in this section and in the State of Chiapas become one river which separates into several currents at various points and unites again in others. We shall mention only the principal rivers of the State, for all told, these are more than 200: Usumacinta, Grijalva, San Pedro y San Pablo, Palizada, which flows into the Terminos

Lagoon in the State of Campeche; the following are confluent of the Usumacinta: the Cojinicuil, the Tepetitán, the Tulija, the Macuspana, the Chinal and the Butujil; the tributaries of the San Pedro y San Pablo are the Tintillo and the Chiquito; between these two rivers an immense island has been formed known as Isla de Chinal. The confluent of the Grijalva are the following: the rivers Almandra, Negro, Tacotalpa, Teapa, Pichucalco, Tepetate, Rio Viejo, Rio Gonzales, Chico, Gonzalez Nuevo, Cunduacan, El Limon, Platanar. In what might be called its upper course, although in no part is it really so, the river Grijalva takes the name of the Mezcalapa. The Tonola river has for its tributaries the rivers Zanapa and Tanocehapa. We must refrain from mentioning more of these rivers; they form as a whole an admirable network of water highways, owing to which the State of Tabasco does not feel the need of railway lines, which would be difficult to construct, as the ground of Tabasco is not very firm.

As may be supposed, the waters of so many rivers, all of them large, form numerous lakes. The principal lakes are Mexcoacan, Cupilco, Machona, Santa Ana. There are a few others of small importance.

The rivers of Tabasco, unlike the majority of the rivers in the rest of the Republic, are navigable for very long distances; this is due not only to their large volume of water but also to the fact that they flow through a vast plain with very little fall, the soil being, as we have already stated, almost uniformly at an elevation of not more than 30 or 40 meters above the sea. The Usumacinta is navigable for more than 500 kilometers, and the Grijalva for a

few kilometers less. If we add to this the fact that the principal confluent is likewise navigable, readers will have an idea of the vastness of the Tabascan river system on which ply a number of small steamers.

There are, as can be gathered from what we have stated, no waterfalls, and it would be difficult to create them by artificial means; for this reason, the natural current of the rivers, which is nowhere very strong, is all that could be relied upon for the production of electric power.

Sights and Archaeological Ruins.—The whole of the State of Tabasco is one vast forest full of broad, full-flowing rivers, with beautiful scenery and an abundance of delightful views in the clearings of the forest or on the lagoons formed by the back waters of the rivers. The same may be said of the whole region. As a place for excursions, there could be no better region than the State of Tabasco.

At Comalcalco there are ruins of buildings belonging to Aztec civilization. Near the port of Frontera there are ruins of teocallis, and at a distance of about two kilometers from the same place there is a large pyramid and the base of a teocalli, adorned with small bricks. Ethnologically this also belongs to the Aztec period. The large base of a teocalli denoting Mayan civilization, is found at Jonuta, on the bank of the Uzumacinta river. Various ruins of Aztec origin are found at Paraiso. At Tecolpa there are four bases of temples and other edifices of Mayan civilization.

TAMAULIPAS

Climate.—The climate prevailing in this State is very variable, although it should be uniform due to

the fact that the State is situated within the flatland near the ocean and that there are no great geographical contrasts. On the whole the climate is hot, particularly so in Tampico and along the banks of the rivers that empty themselves into the Panuco; at times the heat is unbearable. It is also warm in the center of the State, in Ciudad Victoria, but not to the same degree as in the regions just named; it is even less so in the northern section of the State. At Tampico the temperature is, on an annual average, 28 degrees Centigrade, 20 degrees in Ciudad Victoria and 18 degrees in the north.

Rainfall.—The regular rainy season lasts from June to September; precipitation is variable; in the south it reaches the average of 1,300 millimeters, 600 millimeters in the center, and 260 millimeters in the flatlands of the northern section of the state.

Sierras.—The State is traversed by the Sierra Madre Oriental, the principal heights of which are the Jaumave and the Maxiscaltzin mountains, the latter in the center of a large plain.

The most notable valleys are those of Jaumave, Las Rusias, Santa Barbara and that of Palmillas.

Rivers.—The rivers of this State are quite important. There is the Bravo river, navigable for 350 kilometers, on which is situated the port of Matamoros which is a port of entry; the river Conchas or San Fernando, into which flow the Cruillas, Arenas, Fresnos and the San Lorenzo rivers. There are some streams in the State which flow directly into the ocean, such as the Chorreras, the Soldados, the "arroyo de la Mision" (the Mission stream), the Soto la Marina, formed by various rivers and streams, such as the Pilon, the Corona, Santa Lucia, Purificacion, Blanco, Angeles, Santa Engracia, or

Ciudad Victoria; towards the south, the rivers El Carrizal, the Tigre or Cachimba, the Barberena and the San Rafael stream empty their waters into the Madre Lagoon. The Soto la Marina river is navigable for 80 kilometers for vessels of ordinary draught. The river Panuco flows into the Gulf near the port of Tampico, this being situated not on the Gulf itself but on the lower portion of the river. The Tamesi river, which near the Gulf receives the Tampoan and other rivers, empties itself into the Panuco.

Some of the rivers we have named offer certain facilities for the construction of artificial waterfalls, although it would be easier to utilize in this region the power generated in the State of San Luis Potosi, at a place called the Salto, near Ciudad del Maiz, or that which is obtained at the Cascada de Regla in the State of Hidalgo. This does not mean to say that there are no waterfalls on the rivers of this State, especially on their upper course, but that they are far less important.

Archaeological Ruins.—This State has no interesting traces of ancient peoples, although tradition designates this region as the parting point of the Tzapotecan race which inhabited the State of Oaxaca, in seeming, in contradiction to the fact that the State is situated on the route followed by the Palenacan civilization.

TLAXCALA

Climate.—The climate of Tlaxcala is temperate and very agreeable, owing to the State being at a considerable elevation above the level of the sea, as it is located at a height of 1,800 meters. In its exposed valleys, such as Apam and Puebla, there

are extreme variations in the climate, and the cold weather is sharp. The mean annual temperature is 16 degrees Centigrade.

Rainfall.—Rains fall from June to September, there being an average rainfall of about 800 millimeters per annum.

Sierras.—The mountains in the State are: the Sierra of Tlaxco, in the South, with peaks 3,000 meters above sea level; the Sierra of La Malinche in the center, which forms the divide for the three large valleys of Apam, Puebla, and Huamantla, and a few smaller ranges which unite to form the enclosed basin of the Valley of Huamantla, to which reference has already been made.

The valleys of the State are the three which we have just named. They contain the most beautiful views, and there are many localities really well worth visiting.

Rivers—Lagoons.—As regards rivers, they are mostly small, with the exception of the Zahuapan which empties itself into the Atoyac river. There is a lagoon, the Xonacula, which is of fair size.

The Zahuapan river has several waterfalls, though they are not very important. These could, however, be utilized to supply power for factories, sawmills, etc.

Archaeological Ruins.—Not many ancient ruins are found in this State. The City of Tlaxcala cannot be considered a ruin, but it serves to mark the place in which the Tlaxcaltec peoples lived. This people, having entirely broken off with the Aztecs, allied themselves with the Castilians upon the arrival of the latter, whom they helped to conquer the territory, thereby, of course, incurring the hatred of the natives, who always considered them traitors to their race.

At Contla ruins of edifices are found the ethnological significance of which has never been determined. At Malinalco, in the district of Tenancingo, there are ruins of a temple and a hill called "Los Idolos" (the idols) and another hill by the name of Tozqui huac, all of Aztec origin. Near the City of Tlaxcala there are diverse ruins of Tlaxcaltecan civilization.

VERACRUZ

Climate.—The climate in this State varies greatly according to the different sections; it is temperate and agreeable in the regions of the towns of Orizaba, Cordoba, Jalapa, Perote, Teocelo, and others; it is hot, and even very hot during some months, in the City and port of Veracruz, in the section of San Andres Tuxtla, Alvarado, Tlacotalpam, Tuxpan, Minatlan, Papantla, etc. Along the coast the mean annual temperature is 26 degrees Centigrade, in the other regions, 16 degrees.

Rainfall.—It rains every month of the year, but the regular rainy season lasts from May to October, the average precipitation during the year being 2,700 millimeters more or less.

Sierras.—The mountainous system of the State of Veracruz is very complicated, so much so that the construction of railroads has been impeded because of serious engineering problems. But all these difficulties have been conquered, and the railways connecting the Gulf port with the interior of the Republic cross the most wonderful bridges, such as the Maltrata and the Metlac bridges, and make use of other engineering wonders.

The principal mountain nucleus is the Sierra Madre Oriental (the main eastern mountain chain),

the highest peaks of which are within the boundaries of this State: the Citlaltepētāl or Cerro de la Estrella (the Star Mountain), also called Pico de Orizaba (Orizaba Peak), covered with perpetual snow, being the first one to be observed as one approaches the country from the ocean side; it is 5,700 meters above sea level; then there is the Cofre de Perote, a strangely formed mountain, called by the natives Naucampatepētāl, which means "box or trunk mountain," 4,089 meters above the level of the sea. The San Martín Mountain, in the volcanic sierra of the Tuxtlas, has a height of 1,500 meters above the sea, being the principal crater of the Tuxtla Volcano. There are other important mountains or hills noted for their height or for the fact that on or near them petroleum wells are being exploited, as for example the Cerro Azul, the Cerro Viejo, the Carrizal, the Ayacahuitl, the Borrachas and others. Important also is the sierra of Zongolica on account of the richness of its flora.

Rivers—Lakes—Lagoons.—The rivers of the State are: the Panuco on the border line of the State of Tamaulipas, navigable for a number of kilometers for vessels of considerable draught, and for small steamers as far as a little beyond Tamaunchale in the State of San Luis Potosí. The Tuxtla river does not carry sufficient water to be of any service for navigation as far as steamers are concerned, but it has sufficient water to float barges and other flat-bottomed craft; the Tecolutla which rises in the Necaxa river the principal waterfall of which is utilized for the production of motive power and light; the Czones river, smaller in volume than the first named; the Río Blanco which rises on the flanks of the Orizaba peak, possessing a splendid

waterfall at Barrio Nuevo at present utilized for the production of power for the industries established in that region. The confluents of the Rio Blanco are: the Cuetzala, the Metlac, the San Miguel, the Orizaba, the Infiernillo, the Rio Blanco, the Soledad, the Azucena, the Xochiapa, the Colorado, the Cuichapa, the Paso Laja stream, the Pozuelo, the Tlalixcoyan, the San Antonio stream, the stream of San Cristobal, the Otapa, the stream of Urbina, the Coyoluca, the Palmilla, the Pinillos, the Estanzuela, the Amates, the streams Guaringo, Hondo, Pinones, Jobo, Mondongo, Coyol, Coapan, etc. The Papaloapam river, one of the most important in the State, several kilometers of which are navigable for steamers, is made up by the confluence of a number of rivers of the States of Oaxaca and Puebla; at its entry into the State of Veracruz it has a number of waterfalls which could be utilized. The principal tributaries of this river are: the Amapa, the Chichicalzapa, the Enmedio, the Tonto, formed by the confluence of the Petlalpa and the Altotonga; the Rio Grande, the Rio Obispo, the Cajones, the Chiquito, the Manso, the Rio Playas, the Vicente, the Tesechoacan, the Rio de la Lana, the Trinidad, the San Juan, the Hueyapan, the Tuxtla and the Tecolapan, all of which form a beautiful river net which is not unlike that of the State of Tabasco or the State of Chiapas. If to this river belt we add the proximity of the system of the river Coatzacoalcos, a navigable river carrying a large body of water, the large steamers going as far as Minatitlan, we gain an idea of the hydrographic net of the State of Veracruz. The confluents of the Coatzacoalcos river are: the Agachapan, the Temaloapan, the Guasuntlan, the streams Tapazulapan and Micha-

pan, the Chacalpa river, the Colorado, the Azul, the Miniapan, the Jaltepec, the Naranjo, the Chachiapa, the Solosuchil, the Juanes, the Coachapan, the Uspanapa, the Nanchital, the Desengano, the Coanochapan and others that flow in the State of Oaxaca. The soil within these river belts is extremely fertile, and better suited for agricultural enterprises than that of Tabasco, since it is firmer. Here intensive agriculture can be engaged in.

The lakes and lagoons worth mentioning are: the lake of Catemaco, from which rises the Tuxpan river; the Tamiahua lagoon, the lagoon of Alvarado at the northern border of which is the "Laguna Camaronera," and at the southern end the Tlalixcoya lagoon; then there is the Laguna de Pueblo Viejo, the bar of Tanguijo, that of Tonalá and the lagoon of Santicoman.

There are numerous waterfalls in the valley of Orizaba on the Rio Blanco and on several of its tributaries, the most important one being that of Barrio Nuevo. Near Coatepec there is a splendid waterfall called Xico which could be immensely useful. Here the water falls from a height of 80 meters, carrying a considerable volume of water.

Sights—Archaeological Ruins.—The valleys in the State of Veracruz are notably beautiful. Surprisingly beautiful and enchanting landscapes are constantly met with, and the road from Veracruz to the City of Mexico is simply entrancing, full of attractions for the tourist.

There are numerous archaeological ruins in different sections of the State, in Misantla, in Perote, in Papantla, etc. The most notable ruins are doubtlessly those of Papantla, consisting of a pyramid of

six stories, perfectly visible and another story at the base which is covered up with earth. The large blocks of porphyry used in the retaining wall must have been carried with the greatest difficulty to where they are; they show bas-reliefs representing animals, especially reptiles. These ruins are the relics of a civilization, supposed to be older than the Maya-Quiche and contemporaneous with the races that constructed the "Palenque," which is attributed to the Maya-Quiches, on account of the fact that they inhabited the region of the Palenque. History knows little of the first races that constructed pyramids and mounds along the coasts of the Gulf and far into the United States where these people are called mound-builders, due to their inclination to build these artificial mounds or hills, seemingly intended to protect themselves against the inundations of the rivers and to watch the great valleys and the plains where they probably had their cultivated spots of land.

Opposite the village of Alvarado, in the southern part of the estuaries formed by the banks of the river Papoalapan there are ruins of sepulchres and of a town, belonging to Totonacan civilization.

Near the bar of the Santecomapan there is a monument of the same name within the sepulchres of which numerous objects are found and dating to Mayan civilization.

At Cabeza Colosal there exists a monument known as the "Cabeza (head) de Hueyapa" of Totonacan origin.

At Castillo de Teoyo there is the base of a teocalli situated in the center of the plaza; the ruins are in a very good condition, and belong to the Aztec civilization.

Sepulchres and ruins of towns are found at Cate-maco, of Mayan origin.

Diverse monuments are located at Cotaxtla, supposed to be of Totonacan origin.

Ruins of a Totonacan town are found at Chichualoque.

A famous pyramid surrounded by sepulchres, also of Totonacan origin, are to be seen at El Tajin.

There are ruins of another Totonacan town at Espinal, Paso del Correo.

Ruins of Totonacan edifices are found at Huatusco.

Ruins of temples and sepulchres, denoting the same period of civilization are located on the island of Sacrificios.

Ruins and sculptured stones are found at Maltrata; they are of Aztec origin.

Very important monuments of Toltecan origin are found at Metlatoyucan and Mesa de Coroneles.

At Naulinco there is a Totonacan teocalli.

There are Totonacan temples in the grottoes of Nogales.

In the municipal cemetery of Orizaba there is a large sculptured rock known under the name of El Gigante (the giant); it is a remnant of Aztec civilization.

Various monuments of Mayan origin are found at Panuco.

Diverse monuments of Mayan and Aztec origin can be seen at San Andres Tuxtla.

Diverse ruins and an idol four meters high, of Aztec origin, are at Tuzapan. The idol is called "Diosa del Agua" (the water goddess), because people believe that it provides the village with water.

YUCATAN

Climate.—The climate in this State, taken in general, must be called hot, being nevertheless considerably modified during the year, so that the temperature is the highest during the months of July and August, falling very much during the winter, due to the influence of the Northerners which usually blow from November to the end of February. The temperature reaches an average of 25.8 degrees Centigrade. The sections of the country along the coast and the brow of the hills enjoy, of course, a much milder climate. It is a noteworthy fact that the temperature during the nights the whole year round is mild and agreeable, and consequently most refreshing.

Rainfall.—The rainy season includes the months of June, July and August, the average annual precipitation being 807.2 millimeters.

Sierras.—The ridge of mountains of the Sierra Madre crosses the Districts of Maxcanu, Ticul, Tekax and Peto; its altitude nowhere exceeds 300 meters.

Rivers.—There is not a single river in the State of Yucatan, but there is an abundance of subterranean water sources; these sources are always on the same level with the ocean and have a certain amount of flow; their surface openings are either natural or artificial. The most famous of these sources, extremely deep and extensive, is situated in the neighborhood of the town of Valladolid.

Sights—Ruins.—The State of Yucatan offers to the tourist most interesting places for excursions, agreeable and at the same time very instructive. In the District of Ticul we have the most famous

ruins of Uxmal, palaces and temples of the ancient Mayan times; they are frequently visited and admired for their architectural beauty and indelible paintings. Not less noteworthy and similar to those named are the ruins of Chichen Itza in the District of Valladolid. Within the plantation of Chalcehtok, in the District of Maxcanu and in the Districts of Tekax and Loltun a number of curious natural grottoes are found, worth while visiting.

Ruins of Mayan edifices are found at a place called Ac; also a pyramid, of the same civilization period, at Ake; ruins of ancient Mayan temples are found also at Acanceh. At Itzimite there are ruins of Mayan edifices, and a large cyclopean pyramid and the ruins of several temples at Izamal; at Kabaha there are also ruins of Mayan edifices, as are also at Koba. Ruins of precious Mayan palaces are to be seen at Labna; ruins of Mayan edifices at Macuba. At Mayapan, the ancient Capital of the Mayans, there are the ruins of an important temple and ruins of other edifices; on the plantation of Escanchacan there is embedded in one of the corridors the stele of Mayapan. Various ruins can be observed at Tixcocab, they belong also to Mayan civilization. Mayan fortifications are found at Tulun.

ZACATECAS

Climate.—There are two distinct climatic regions in this State, the one is temperate, that is, the southern section of the State, though really it should be called "temperate-hot," and the other section, situated in the north and center of the State, is temperate-cold. The State is situated on the Central and Northern Plateaus, both zones being separated by

the sierras of Zacatecas, Fresnillo, San Andres and Chalchihuites, joining the Sierra Madre Oriental in the Sierra of Michis, of the State of Durango. The warm zone is the one situated on the Central Plateau where sugar-cane is produced; it is the richest section of the State. The northern plateau is rather barren, although covered with excellent pastures and forests of mesquits, "huisaches" and several species of "opuntias." The climate is temperate, the average temperature during the year being 14 degrees Centigrade. In the city of Zacatecas, situated 2,443 meters above the level of the sea, in Sombrerete, Mazapil, Nieves and in other places, the cold is intense.

Rainfall.—The regular rainy season lasts from June to September. During the rainy season the cattle find watering places in the small lagoons or ponds formed by the heavy rains; these ponds dry out before the month of December, and the rangers have to concentrate their herds in places where there is sufficient water. The mean annual precipitation reaches 451 millimeters.

Sierras.—The State of Zacatecas is very mountainous; its system of sierras is generally known under the name of Sierras of Zacatecas which divide the central from the northern section of the State. There are, furthermore, the sierras of Pinos, in the southeast; those of Mazapil, in the north; the sierras of Fresnillo, Sombrerete and Chalchihuites, in the center; and those of Jerez, Huejuquilla and Juchipila, in the southwest of the State. These mountains have considerable altitudes, such as that of La Bufa, near Zacatecas; that of Veta Grande in the mining zone of this name; that of Montedeuma near Sombrerete; also the Sombreretillo, the Aguila

near Chalchihuites, the Pico de Teyra near Mazapil and several others. On the border line with the State of Durango there is the Papanton peak, one of the highest in the State, at the foot of which is found the once famous mining camp of Noria de San Pantaleon. The peaks known under the name of Bufa, Veta Grande, Papanton and Cerro del Aguila have an altitude of more than 3,000 meters above sea level.

Rivers—Lagoons.—Since, as we have stated, the mountain ranges divide the State into two regions, its rivers run either towards the north or in the southern direction. The northern plateau is watered by the Aguanaval river which rises near Fresnillo; it takes the name of Rio Grande, and enters the region of San Juan de Guadalupe in the State of Durango, watering further on part of the State of Coahuila, and emptying its waters in the Lagoon of Parras. The towns and farms situated along the banks of this river are very picturesque. The other rivers are: the Ojo Caliente which enters the State of Aguascalientes; the Juchipila which provides most of the water for the canefields; the Tlaltenango and the San Andres del Teul river. The rivers Chalchihuites and San Antonio or Sombrerete flow towards the State of Durango; both together form the Suchil river and reach the Pacific Ocean through the Tunal river which goes by the name of San Pedro in the State of Nayarit.

The State has several lagoons, that of Valderama in the Valley of Valparaiso, and several salt lagoons in the part of the Salado Valley which belongs to the territory. There are other small lagoons in different parts of the State, such as that of Concepcion de Heredia and others. None of the

rivers in this State are navigable, nor are there any waterfalls, but such could be built on the numerous streams by means of reservoirs.

Sights—Archaeological Ruins.—The State of Zacatecas has wonderful landscapes, especially in its southeastern section, the Valley of Valparaiso being one of the most beautiful sections of the State; also the valleys of Jerez and that of Suchil, part of which belongs to this State, offer wonderful sights.

Worthy of a special visit are the ruins of La Quemada, to the north of the city of Zacatecas, not far from the railroad station of Colorado. These ruins are attributed to the Nahuatlacan peoples and represent structures built after their migration to the Valley. The ruins of La Quemada are of historic interest, giving an idea to the traveler of the civilization of the Indian tribes that populated the Valley of the City of Mexico, although there is nothing left but bases and heaps of stone of what once was the city or temporary settlement of nomadic peoples.

CHAPTER IX

PORTS AND ISLANDS

The principal ports of the Republic of Mexico are in the Gulf of Mexico: Tampico, Veracruz and Puerto Mexico or Coatzacoalcos; in the Peninsula of Yucatan, Progreso; in the Pacific Ocean and in the Gulf of California: Salina Cruz, Acapulco, Manzanillo, Mazatlan and Guaymas.

The ports in the Gulf of Mexico have been improved by splendid engineering works, and are perfectly protected. The ports on the Pacific side are well-protected natural ports.

The large passenger steamers from Europe usually touch only at the ports of Veracruz and Tampico.

Full details concerning the matter of ports and islands in the different States or Territories are found in the following pages.

BAJA CALIFORNIA

The principal ports of the Territory are: La Paz, Todos Santos, Mulege, San Jose del Cabo, Santa Rosalia. La Paz is a port of entry, while all the others are for the coasting-trade. La Paz is situated in a well-protected bay, but it offers no facilities for loading and unloading ships; this being done by means of canoes or barges which go out to meet the vessels at the far-out anchoring places. The port

is visited by large vessels of the following steamship lines: the Naviera del Pacifico, the Naviera de los Estados, the Pacific Mail, the Cosmos and at times by ships of other lines. The usual itinerary of these ships is from San Francisco southwards and back.

There is a regular custom-house at La Paz; the other ports have custom agencies.

Numerous islands belong to the Territory of Baja California nearly all of them uninhabited; rich deposits of guano and plenty of timber are found on them. The largest and most important of these islands are: Encantada, Salvatierra, Angel de la Guardia, Smith, Partida, Raza, Salsipuedes, San Lorenzon, Tortuga, San Marcos, San Ildefonso, Coronados, Monserrat, Carmen, Santa Catalina, Santa Cruz, San Diego, San Jose, Espiritu Santo, Cerralvo, Creciente, Santa Margarita, Magdalena, Santo Domingo, Cedros, San Benito, Natividad, Sacramento, San Geronimo, San Martin, Todos Santos, Coronados and Guadalupe which is the largest of them all.

CAMPECHE

Ports of entry belonging to the State of Campeche are: Campeche and El Carmen, the latter situated in the lagoon known as "Laguna de Terminos." The sea at Campeche is very calm and secure but very shallow; ships of all tonnage have to anchor far outside, loading and unloading by means of lighters or small boats; but even these work under difficulties, on account of the shallowness of the water. The Government wharf could and should be extended and the sea dredged on both

sides of it, so as to allow the lighter to do more efficient work.

The port of El Carmen is large, secure and provided with several adequate wharves, where ships of all tonnage can easily anchor.

The very extensive coast of the State of Campeche has a number of small ports for the coasting-trade; among these we have the ports of Champoton and Palizada.

A navigation company controlled by the Mexican Government carries on a regular passenger and freight service between Campeche and the other ports in the Mexican Gulf, and between Campeche and New Orleans, U. S. A. Furthermore, American and European steamers call frequently at the port of Campeche, in order to load natural products of the State.

The Government maintains regular custom-house service at the ports of Campeche and El Carmen, and lighthouses are kept by the Federal Government for the protection of the ships traveling in the Mexican Gulf, at El Moro, a promontory situated near a village called Seybaplaya at 24 kilometers on the windward coast, and another at cape Xicalanga, in the District of El Carmen.

The islands belonging to the State of Campeche are: Piedra, Jaina, Las Arcas, Aguada, and El Carmen, situated in the Los Terminos Lagoon.

CHIAPAS

The ports of the State are: Soconusco, Arista and San Benito, which are ports of call for vessels doing a coasting and high-seas trade. The ocean-going boats belong to the following companies: Naviera

del Pacifico, Mala del Pacifico, Costa del Pacifico and the Kosmos, which are of considerable draught and can take up to 3000 tons of freight. The vessels of the Compania Naviera de los Estados de Mexico are of lower draught and carry on a coastal trade. The vessels of this company touch at various Central American ports.

All these ports are deficient in facilities for anchoring, as in general the coast is low and sandy. A good deal of dredging and the construction of wharves would be necessary to make good anchorages.

The starting point for the ocean-going steamers is the port of San Francisco, California, and they touch at the ports of La Paz, Guymas, Mazatlan, San Blas, Manzanillo, Acapulco, Salina Cruz, Puerto Arista, Soconusco, from which port they go on to Central and South American ports. On the return journey they call to take on whatever products are intended for the United States.

At these ports there are custom-house departments, with but little business to attend to.

The coast of Chiapas has no prominent geographical features. Along the coast there are some estuaries and large lagoons; then a few lagoons, called in this region "pampas," the most notable of which are La Joya, San Andres, Buena Vista, and San Marcos. From there one reaches the sandy wastes of the Gulf of Tehuantepec.

There are no islands of importance, only small islets of no significance.

COLIMA

The coast of the State of Colima extends over 160 kilometers, without any important geographical

feature, with the exception of the mouths of the Coahuayana river which form the bay of Pascuales. This could be converted into a good anchoring place; then there is the Lagoon of Cuyutlan, artificially connected with the ocean and forming a kind of gulf, which offers an excellent harborage; the port of Manzanillo, one of the most important on the Pacific due to the fact that it communicates with the interior of the country by means of a railroad; then there is the Punta del Carrizal with good harborage for vessels of shallow draught.

Small islets, uninhabited and of no significance, is all that belongs to this State along its coasts. At a large distance from the coast, in the Pacific, there are the islands of Revillagigedo, rich in guano deposits, as are all the islands in the Pacific Ocean.

The only port is that of Manzanillo, visited by ocean-going vessels. It offers no facilities, but these could be provided by constructing dams and wharves.

Vessels of the following companies touch at this port: Naviera del Pacifico, Naviera de los Estados, Kosmos, Mala del Pacifico (Pacific Mail), Costa del Pacifico. Furthermore, a great many ships and craft carrying on a coasting-trade call at Manzanillo.

The port should have more wharves to facilitate loading and unloading. The vessels that touch at Manzanillo are bound for and from San Francisco, California. Manzanillo, being the largest port on the Mexican Pacific coast, is the chief point of departure for travelers on that side.

GUERRERO

The ports of the State of Guerrero are in a state of decay. The port of Acapulco was during the

period of the Spanish Conquest the key to the Pacific Ocean, the cargoes for the Philippine Islands being loaded here. The Mexican traffic on the Pacific side is in general a great deal less important than that on the Atlantic side. Nevertheless, Acapulco is a port of entry and has a custom-house. Sihuatantepec and Petacalco are ports for the coasting-trade; they are of small importance. Conditions would be far better, if the State of Guerrero had easy and rapid means of communication with the interior of the Republic. Vessels of the following companies call at the port of Acapulco: The Naviera del Pacifico, the Pacific Mail, the Kosmos Line, the Compania de Navegacion de los Estados. Some of the vessels that touch at Acapulco are boats of more than 3,000 tons. Acapulco, if not a great port, offers, nevertheless, excellent natural advantages, having a fairly large and well-protected bay. The coast-trade ports offer no facilities whatsoever for loading and unloading.

The sea-going ships that call at Acapulco are the same that touch at the other Mexican ports in the Pacific; they ply between San Francisco, Cal., Central and South America.

As to islands, only the Isla Grande is worth mentioning; it is situated not far from the coast of Guerrero. As is the case with most of the other islands in the Pacific, its only claim to consideration is that it contains deposits of guano.

MICHOACAN

The 163 kilometers of coast which belong to this State on the Pacific offer no bay or any other geographical feature which would permit the build-

ing of a port in the true sense of the word, nor are there any islands belonging to this State; the only geographical details are the points or promontories of Tejupa and San Telmo.

Buceras and Maruata are two villages near the coast which could serve as ports for the coast-trade, if there were any roads leading from them to other places of the State; the people of these villages do not even engage in the fishing trade, since they have no market for their product.

NAYARIT

The port of San Blas belonging to this State is a port of entry. It is situated near the mouth of the Santiago river and offers no facilities for loading or unloading vessels, this work being done by means of small craft. The navigation companies, the ships of which call at this port, are the same we have mentioned in speaking of the other ports on the Pacific coast. The largest ships that touch at San Blas are ships of 3,000 tons.

The islands Las Tres Marias belong to this State; they are covered with a rich vegetation and one of them serves as the place for a penal colony, especially for petty thieves who are sent here from all over the country. There are large deposits of guano on these islands.

OAXACA

The State of Oaxaca has a fairly high and firm coast, which is easily approached and has several inlets which could be readily made use of as ports. It is unfortunate that in Mexico the best natural

ports are located just where the shipping needs are least. On the Gulf of Mexico, where the traffic is greatest and on which side lies the nearest and largest portion of the civilized world, the coast line is not suited for shipping, and also has second-rate ports which have been made serviceable by means of jetties and dredging works; on the Pacific side, on the other hand, there are magnificent natural ports which would require very much smaller outlay to make them available, being deep and well-sheltered bays, in which the traffic could never be in excess of their capacity. The coast of Oaxaca is high and has numerous indentations, but it has also the ports of Salina Cruz and Puerto Angel. At its eastern extremity it has what is called the "Mar Muerto," in which there are the Upper and the Lower Lagoons, after which comes the Gulf of Tehuantepec, with its sandy beaches; beyond that point the coast begins to rise. Here is the Ventosa Bar, where the Tehuantepec river empties its waters, the port of Salina Cruz, followed by the Chacahua Lagoon, Puerto Angel, and the mouths of the Verde and Omotepec rivers. The islands which lie along the coast are small and unimportant.

The vessels which visit the Oaxaca coast belong to the following companies: The Naviera del Pacifico, the Pacific Mail, the Kosmos, the Costa del Pacifico, the Naviera de los Estados. The larger number of these vessels are of medium draught, notwithstanding the fact that the ports could take large vessels of more than 3,000 tons.

There are no facilities for loading and unloading, except at the port of Salina Cruz which is the best port of the State.

The vessels which call at these ports start prin-

cipally from San Francisco, California. Salina Cruz has a custom-house; the port of Angel has a customs agency.

QUINTANA ROO

The coast of Quintana Roo has several small ports. Payo Obispo is a port of entry with custom-house and lighthouse service. Vessels ranging from 40 to 50 tons visit this port regularly. Most of these vessels start from Cozumel and go as far as Belize, British Honduras, touching at Payo Obispo; they belong to the navigation company of Colo & Bonastre. Puerto Madero, Morelos and Xcalak are ports for coasting-trade only. Cozumel is the largest island belonging to the Territory of Quintana Roo; it has a port of entry with custom-house and lighthouse and is visited regularly by one of the United Fruit Company's White Fleet steamers, plying between New Orleans and British Honduras. Another island belonging to Quintana Roo is Isla Mujeres; this has the shape of a horseshoe, thus yielding protection to vessels during stormy weather; it has a lighthouse and a custom-house. Contoy and Chinchorro are small barren islands having a lighthouse for the protection of the vessels plying in those waters.

SINALOA

The ports of this State are: Mazatlan, Topolobampo, Altata and Elota; the first-named is a port of entry and one of the principal ports of Mexico on the Pacific coast, the importance of which will be greatly increased as soon as it is connected with the State of Durango by the Sierra Railroad. The other ports are serving the coasting-trade. First-class

ships of large draught call at Mazatlan; it is a natural port which needs jetties and more wharves in order to render better service. The companies that have their ships call at this port are the same that touch at the ports of Chiapas, Oaxaca and other States. Mazatlan has a regular custom-house, while the other ports have only customs agencies.

A few small islands belong to the State of Sinaloa, most of them covered with tropical vegetation and containing deposits of guano which is shipped to the United States. These islands are: Pajaros, Venados, Bacedito, Altamira, Saliacu, San Ignacio, Santa Maria, Lechuhuilla. All can be easily reached by canoes.

SONORA

The State of Sonora has two ports: Guaymas which is a port of entry of considerable traffic, being visited by more than six hundred large vessels a year. It has a custom-house and is visited by all the steamers that ply between San Francisco, Cal., and the Central and South American ports. This port has all the necessary facilities for unloading and loading the vessels. The port of Agiabampo is situated in a well-protected bay and could easily be converted into a good anchoring place.

The islands which are a part of the State are of small importance; the largest one is that of Tiburon, inhabited by the Seris Indians, of a wild and fierce character, living a primitive life, mostly engaged in fishing and hunting; then there are the isles of Ciari, San Pedro Nolasco, San Esteban and Turner; they are small and only of some importance on account of their guano deposits.

TABASCO

The coast of Tabasco is low and marshy; it has no ports or bays in which to give shelter to vessels, which are in consequence obliged to anchor at the entrance to the rivers, the united bars of the Usumacinta and Grijalva rivers at Frontera; and the bars of the rivers San Pedro y San Pablo, Chiltepec, Santa Ana, Dos Bocas being the most important; these bars are the only ports of the State, that of Frontera being for ocean-going vessels. Owing to the necessity of the steamers calling there the City of Villahermosa has become a port of call for ocean-going ships. Villahermosa is situated far up the river. The other ports are simply ports of call for coasting-trade vessels. Frontera is a port of call for vessels of large draught belonging to various companies, such as the Naviera del Golfo, the Ward Line, the United Fruit Company and others. The smaller ports can take fair-sized vessels which are carrying on coast service. Vessels of 5,000 tons can go up the river to Villahermosa.

The ports of Tabasco, not being really suited by Nature or by artificial improvements for the anchorage of vessels, have no facilities for the loading and unloading of merchandise, all this being effected by means of launches with a consequent enormous loss of time and many other inconveniences.

The vessels which touch at Frontera, always do so after calling at Veracruz, thence proceeding to El Carmen, State of Campeche and Progreso; then they continue their journey to Havana or to other foreign ports. The coasting vessels call at all the ports as they go along the coast, sometimes in one direction and sometimes in another.

There are no islands on the coast of the State of Tabasco. We have mentioned one in another chapter, as being formed in the interior of the State by the two rivers Tintillo and Chiquito; it is very large and extremely fertile.

TAMAULIPAS

The ports of the State of Tamaulipas are: Tampico and Matamoros which are ports of entry, and Soto la Marina, a port for the coasting-trade. The port of Tampico is situated on the Panuco river at a distance of more than one kilometer from the Bar which is like the mouth of the river, where there are the breakwaters or jetties helping in keeping open the entrance to the sea. This port is visited by ships of large tonnage, vessels of more than 3,000 tons, the principal of which belong to the following companies: The Cuban Steamship Company and the Linea Canadiense Mexicana; the ships of the first-named company ply between the ports of Tampico, Veracruz, Puerto Mexico, London and Antwerp; the vessels of the other company follow the route: Veracruz, Tampico, Progreso, Halifax and Montreal. Furthermore, many other ships, either petroleum or merchant vessels, and such other steamers as are engaged in coasting-trade, as well as river steamers plying between this port and Tamaulachale visit this port.

The port of Tampico has no harbor facilities and important engineering works are required to make it a commercially useful haven. For the loading and the unloading of vessels there are fairly good wharves. The other ports are of secondary importance. There is regular custom-house service at the

ports of Tampico and Matamoros, and a customs agency at Soto la Marina.

This State has nothing that deserves the name of islands, for such cannot be called the sandy and barren strips of land separated from the mainland by the lagoons known as "Laguna Madre" and "Laguna del Lloron." These have no importance whatever.

VERACRUZ

Although the coast of Veracruz is low and sandy with the exception of the littoral of Alvarado which is swampy, there are several ports which offer good anchoring facilities effected by the skill of man. The port of Veracruz has always been the principal and most important port of the Republic, being visited by the largest number of ships of all sorts. Tuxpan and Puerto Mexico are ports of entry. Ports for the coasting-trade are: Nautla, Tecolutla, Puerto Lobos, Alvarado. The large ports, of course, are also engaged in the coasting-trade. Steamers of the following companies call at the ports of this State: Compania de Navegacion, plying between Tuxpan, Veracruz and Puerto Mexico, and between Veracruz and Frontera; the Tampico Navigation Company doing coastwise trade between Veracruz and Tamiahua; the New York and Cuba Mail S. S. Co., touching at the ports of Veracruz, Progreso, Havana and New York; the Leyland Line; the Harrison Line; the Compagnie Transatlantique Francaise; the Transatlantica Espanola, the Cuban Steamship Co., the Benemelis S. S. Co., the Bacon S. S. Co., the Hamburg-American Line, the Royal Mail S. S. Co., the Linea Canadiense Mexicana. Steamers of a number of other lines call occasionally.

Many companies are engaged in the coasting-trade; they are considered Mexican, although they are mostly financed by foreign capital. The many wharves at the port of Veracruz are constructed in such a way as to allow of the anchorage of the largest possible number of ships; these and the jetties are evidences of splendid engineering work. At the port of Puerto Mexico jetties also had to be built in order to protect the ships; it is situated at the mouth of the Coatzacoalcos river and is the terminal of the railroad on the Isthmus of Tehuantepec, having all modern loading and unloading facilities.

The port of Tuxpan is situated at the mouth of the Tuxpan river; it offers no great facilities to the vessels that call at it, that is at the present time, for the proper engineering works necessary to attain this end are only being planned for the future. The small ports doing coasting-trade offer the same difficulties in the matter of loading and unloading vessels. The best of them is the port of Alvarado, situated within the lagoon of the same name which serves as a bay.

The custom-house of Veracruz is of the greatest importance. Tuxpan and Puerto Mexico also have custom-houses.

The islands belonging to the State of Veracruz are of small importance being reefs of rocks or banks. The most notable are: the reef of La Gallega on which the fortress of San Juan de Ulloa is situated; the Isla de Sacrificios, where there is a lazaretto for infectious diseases. There are furthermore the reefs of Hornos, La Lavandera, the Bank of El Burro and several small islets within the

Lagoon of Alvarado; then the islands of El Idolo and Pajaros in the Gulf.

Most of these islands are uninhabited.

YUCATAN

Progreso is the only port of entry in this State; it is visited by all kinds of ships, and has, of course, a custom-house and a first-class lighthouse. The sea at this port is very shallow, so that the ships have to cast anchor at a distance of four or five miles from the coast. This inconvenience is remedied as much as possible by a well-organized lighter service. There are here five wharves belonging to the Yucatan Railroads which can be reached only by such craft as draw but a few feet of water. Companies sending their ships to this port are: the Ward Line, whose ships, carrying freight and passengers, follow the route New York, Havana, Progreso, Veracruz, Tampico, returning by the same route to New York. Then there is the Mexican Navigation Company, some of whose ships ply between Progreso, Veracruz and New Orleans, La., touching at Tampico on their return trip, while other ships of this company are coast liners, calling at Progreso, Campeche, Laguna, Frontera, Puerto Mexico and Veracruz; the regular cruise of these ships is between Tampico and New Orleans. Besides the ships of the companies named a number of vessels of other companies and nationalities come to Progreso.

The small ports of Sisal and Celestun serve the coasting-trade only.

CHAPTER X

FLORA AND FUNA, HUNTING AND FISHING

Most of the trees and plants that have any application in commerce or industry have been indicated in the chapters on Agriculture and Forests; this chapter is intended to complete those data as far as the flora and fauna of Mexico are concerned.

In most cases we have added to the common name of the plants the corresponding botanical one; in all such cases where this has not been done, our aim has been not to repeat too often terms already given in the case of other sections of the country. At the end of this book, however, the reader will find an alphabetical list of common and botanical names of all the industrial and commercial plants, trees and fruits which have been mentioned in the various chapters. As a rule we have given the local name of the plants, generally of Indian origin; of such names there exists no reliable translation in English. The explanation of the scientific terms can be found in a good dictionary.

In the matter of the Mexican fauna we intend to give the names of all such animals as produce hides, skins, and thus enter the commercial and industrial trade.

The forests and mountains of Mexico offer the finest opportunity to those that like to engage in hunting game of all kinds, either for the sake of the sport itself, or for other purposes, such as obtaining

fine skins, etc. For the fishing sport and the fishing industry there are a number of opportunities in different sections of Mexico.

Complete details concerning all these matters are found in the following pages, according to the different States.

AGUASCALIENTES

The State has many plants which are of industrial use. Without repeating those we have pointed out as being of special agricultural interest, we may mention: red oak, the bark of which furnishes tanning material; the castor-oil plant, which grows abundantly; the "palma" which is useful for coarse sail-cloth making, the "lechuguilla" producing ixtla fiber. There is also "zacate" for broom-making, which is very little utilized by the inhabitants of this section.

Hunting is of little interest, as only the "coyote" (*canis latrans*) is abundant; it is hunted as much for the protection of the sheep and goats, which the coyotes frequently attack, as for the skin.

Fishing is not, and cannot be of any importance in this section.

BAJA CALIFORNIA

Many sections of this territory have the aspect of desert regions with the corresponding vegetation. In Baja California there are many species of palm-trees, among them the date-palm (*phoenix dactylifera*), the yucca palm (*yucca australis*), another palm, the botanic name of which is *dracena indivisa*, the "palma de las pampas" (*grinerium oleander*), the "palma de San Pedro" (St. Peter's palm—*yucca decipiens*), "palmito" (*yucca rigida*), another "palmito" (*yucca treculeana*), "palmera" (*prichar-*

dia phillifera); several species of "maguey" or agaves, such as "henequen" (*agave rigida*), "maguey cenizo" (*agave quiotifera*), "maguey del cerro" (*agave asperuna*); "lechuguilla" (*agave heteracantha*); "damiana" (*thurnera diffusa*), "damiana" of California (*thurnera aphrodisiaca*), the yellow poppy (*eschscholtzia californica*), "escoba" (*brickelia spinulosa*), "estropajo" (*luffa cylindrica*), "evonimo" (*evonimo japonica*), "garambullo" (*cereus geometrizans*), "guayo" (*melicocca bijugal*), "izote" (*yucca* sp.), "jojoba" (*simmondsia californiana*), "jinicuil" (*inga jinicuil*), "hoja pinta" (*samsevieria Zelanica*), "hierba del borracho" (*calamintha macrostema*), "malva prieta" (black mallow—*abutilon* sp.), "marihuana" (*cannabis indica*—Indian hemp), "nanche" (*birsonima crassifolia*), "norote" (*epicampes macroura*), nettle (*urtica* sp.), "organo" (*cereus marginatus*), "ocotillo" (*fouquiera splendens*), "orchilla" (*roccella tinctoria*), "pajon" (*sporobolus wrightii*), "pitahaya" (*cereus variabilis*), "peyote cimarron" (*lophophora williamsi*), "palo blanco" (*lysiloma candida*), "palma real" (*roystonea regia*), "sangre de grado" (*jatropha spatulata*), "torote" (*bursera microphylla*), valerian (*valeriana mexicana*), "viznaga" (*echinocactus electracanthus* and other species), "nopal" (*opuntia*—several species), *yucca* (*manihot palmata aipi*).

Game is plentiful in the Territory, of course, away in the mountains where it can always find water. The wild sheep (*ovis cervina*) lives in the most solitary sections of Baja California and Sonora; there are also deer (*cariacus virginiana*) and rabbits (*lepus troobridgei*), etc.

Fishing is actively engaged in, the most productive being pearl diving. The principal species of fish

caught along the coast of the Territory are: "raya" (*urolophus halleri*), eel (*myrichtihis tigrinus*), "lisita" (*elops saurus*), "balao" (*chryodorus atherinoides*), "liza" (*mugil hospes*), another species of "liza" (*mugil cephalus*), "alabacora" (*germo alalunga*), "sierra" (*scomberomorus sierra*), "cabrilla" (*hypoplectrus gema*), "cabrilla de artillero" (*mucroperca jordani*), "palometa" (*vomer setipinnis*), "mojarra" (*xystaema cenereum*), "jiniguano" (*lytrulon flaviguthatum*), "sargo" (*archosargus pourtalessi*), "mojarra de aletas amarillas" (*gerres peruviana*), "chopa rayada" (*lagodon rhomboides*), "perico" (*pseudoscarus perrica*), "mojarra" (*gerres olithomus*), another "mojarra" (*cymatogaster aggregatus*), "lapon" (*scorpaena mystes*), "botete" (*spheroides lobatus*); this species is very harmful to the pearl-bearing oysters, being therefore very much dreaded and exterminated by the fishers; "cazon" (*carcharhimus aelatorus*). Furthermore are fished: the two-colored "erizo" (*murex bicolor*), "abulon negro" (*haliatis cracheroddi*), mother-of-pearl shell (*avicula margaritifera mazatlanica*) and another species, the *avicula margaritifera vinesi*, sea-turtle (*chelonia imbricata*), "estrellita" (*tundulus stellifer*), yellow "pargo" (*neomaenis argenti-ventris*), lobster (*panulirus inflatus*), three species of whales, *i. e.*, the "megaptera versabilis," the "rha-chionectes glaucus" and the "sibalgicus sulfureus"; the "cachalote" (*phiseter macrocephalus*), the dolphin (*phocoena vomerina*), four species of seal, *i. e.*, the "calorhinus ursinus," the "eumetopias stelleri," the "macrorhinus angustirrostris," the "zola-phus californianus," large oyster (*ostrea fron*), oyster (*ostrea virginica*), "oreja de mar" (*haliotes gigantea*).

The fishing trade could be greatly extended in the waters of Baja California. In past years the pearl fisheries alone brought in an annual business of \$1,500,000.

CAMPECHE

Flora and fauna in this State are very abundant. Among the plants and trees of industrial application we have the Mexican agave or sisal, the campechea or logwood, the sapota, the mahogany, the cedar, the castor-oil plant, the rubber-tree (castilloa), the "pochote" or "kapoc," several species of palm-trees, the leaves of which are used in the manufacturing of hats, the "chucum," the bark of which serves for tanning, the "chacte" used for the manufacturing of doors and beams, and the "jabin," employed for naval construction.

As samples of the fauna we have the deer, of which there are several species, the tiger, the tiger-cat, the wild hog or "quitan," the puma or American lion, the tapir. There are, besides the animals named, a good many others. Far enough away from the towns and settlements there is plenty of game.

Worthy of special mention is the excellence and great variety of fish in the tranquil waters of the Bay of Campeche. On the windward coast and in the river Champoton oyster banks establish their numerous colonies, while different families or species of chelonians agitate the waters.

CHIAPAS

There is a prodigious wealth in this State in the vegetable no less than in the animal kingdom. As

to the flora we will just quote a few of the many trees and plants which may be considered of manufacturing value. A great many of these have already been indicated in the chapters on Agriculture and Forests.

First of all we would bring to the notice of the reader the "caucho" or rubber-tree which is extremely abundant; the "chicozapote," the gum of which enters into the manufacturing of chewing gum; there are incalculable quantities of this tree; two species of cotton-trees, the "eriodendron grandiflora" and the "eriodendron aesculiforme," which produce a high grade cotton, these trees forming immense forests by themselves; the indigo-plant (*indigofera anil*) which is the largest indigo-producing plant in the world; the tobacco plant; saffron and "azafrancillo," dyestuffs; "linaloe" and *tecomac* which produce a highly priced essential oil; quinine (*cinchona succirubra*), of well-known medicinal value; the poppy (*papaver somnifera*) which has sedative properties; camomile (*centaurea minor*); the castor-oil plant; the mallow plant, the marshmallow, aloe, *digitalis*, balm or balsam, the "hierba buena" (*mentha viridis*) and many other medicinal plants. Among the dye-producing plants may be mentioned the arnotto tree (*bixa orellana*), brazilwood, campechea-wood; "toronjil" (balm gentle), the sandalwood-tree, the copal-tree, all of which are abundant, the "chilte" (*manihot foetida*), the "canagria" (*rumex hymenoscephalus*), the "cuapinole" (*hymenea courbaril*), which produces a flour similar in every respect to the ground and roasted corn-grain, being known by the name of "pinole"; it also gives a good oil.

The *fishing* which is carried on in the rivers of

the State and also along the coast is important; the fish consist of several varieties. In the Usumacinta river large quantities of "almeja" (shellfish—*unio crocodilatum*) are caught. Sponges are gathered on the coast.

Game is plentiful throughout the State and the finest skins have to be shipped without tanning, losing much of their value, because curing processes are unknown in the country. The tiger or leopard is found in large numbers. The tapir (*tapiarella bairdi*) exists in a wild state in the forests in immense droves, being only occasionally hunted. Among the birds we should mention the magnificent "quetzales," the sacred birds of the primitive Maya-Quiche tribes, who were the inhabitants of Na-Chan or Palenque. They are probably more abundant in the State of Chiapas than in the Republic of Guatemala, where there is a city named after this extremely beautiful bird, *i. e.*, the city of Quetzaltenango. The heron or "garza habada" (*tigrisomax cabanisi*) exists in large numbers on the rivers and lagoons.

CHIHUAHUA

There is a great variety of vegetation in this State. Next to the desert vegetation in the Bolson section we have the temperate climate of the central valleys, the cold zone with its corresponding growth in the western sierras, and the tropical vegetation in the gorges and ravines near the States of Sinaloa and Sonora. Among the great number of plants that can be industrialized we mention the following; most of these have already been indicated in the chapters on Agriculture and Forests: the caperbush (*spomoea* sp.), "escobilla" (*schkukria virgata*),

"amole de bolita" (*sapindus marginatus*), "anemona" (*anemone mexicana*), "anisillo" (*tagetes micrantha*), "barbas de chivo" (*clematis dioica*), "trompillo" (*solanum elaeagnifolium*), "reed or carrizo" (*arundo donax*), "chia" (*salvia hispanica*), "chia cimarrona" (*salvia pseudo chia*), "copalquin" (*croton tiglium*), "chicalote" (*argemone mexicana*), "candelilla" (two species: *euphorbia antisiphilitica* and *euphorbia cerifera*), "canapis" (*sorghum vulgaris*), "cadillo" (*xanthium canadense*), "coyol" (*acromia mexicana*), "chachamole" (*nymplaea ampla*), "cicuta" (*conium maculatum*), "chaparro" (*mimosa* sp.), "chamal" (*dioon edule*), "chilillo" (*grymis winteri*), "engordacabras" (*dalea tuberculata*), "estafiate" (*artemisia mexicana*), "estrelita" (*milla biflora*), "encinilla" (*croton dioicus*), "flecha de agua" (*sagitaria variabilis*), "garambullo" (*cereus geometrizzans*), "gobernadora" (*larrea mexicana*), "guayul" (*vauquelia corymbrosa*), "guayule" (*parthenium argentatum*), "granjeno" (*celtis pallida*), "garabato" (*pisonia hirsuta*), "gatuno" (*mimosa biuncifera*), "guayacan" (*guaiacum sanctum*), "guayacan colorado" (*tabebuia guaiacan*), "grama" (*cynodon dactylon*), "ixtle" (*agave* sp.), "jaboncillo," which in the region of Batopilas is known under the name of "gamonero" (*sapindus drumondi*), "hierba del zorillo" (*croton devicus*), several species of the agave plant, "manzanilla" (*matricaria chamomilla*), "mirasol" (*helianthus annuus*), "mostaza" (*brassica nigra*), "madreselva" (*lonicera carpfolium*), "nardo" (*polianthes tuberosa*), "ninfa" (*nymphaea*—several species), "nopai" (*opuntia*—several species), "oregano" (*brickelia veronicaefolia*), "oregano" (*lippia graveolens*), "organo" (*cereus marginatus*), "otate"

(guada sp.) "acebuche" (*forrestiera murocoides*), "parra silvestre"—wild grape-vine (*vitis aestivalis*), "pajon" (*epicampes macroura*), another species called "pajon" (*sporobolus wrightii*), "palma" (*yucca australis*), "palmito" (*yucca rigida*), another species of "palmito" (*yucca treculeana*), "plato y taza" (*hymenocallis ratata*), "toloache de laguna" (*datura ceratocaula*), another species of "toloache" (*datura stramonium*), "tulillo" (*eleocharis palustris*), "tule" (*cyrpus lacustris*), "toronjil" (*cedronela mexicana*), peppermint (*mentha pipenta*).

The *game* in this State consists chiefly of deer (*cariacus virginiana*), "berrendo" or wild goat (*antilocarpa americana*), "coyote" (*canis latrans*), prairie dog (*cynomys ludoviciana*), wolf (*canis lupus*), brown bear (*urus americanus*), silver bear (*ursus horribilis*), buffalo, still found in the wildest and most solitary sections, also known under the names of bison or "cibolo" (*bison americanus*). There also is a great variety of birds.

Fishing has no importance in this State, but it is engaged in in the Papigochic river, where especially "trompudo" (*catostomus sonorensis*) is caught; the people fish river pearl oysters (*nephronaias aztecorum*) in the river and lake of Conchos.

COAHUILA

Few vegetal species grow in the State which are not of the desert type, of which there is an infinite variety. It is generally believed that the botanical species are very few in these regions. But this is not so. The truth is that there are numberless desert plants which mostly are absolutely or nearly unknown. The agricultural plants growing in this

State have been fully indicated in the chapter on Agriculture. Industrial plants, that is plants that already are or can be utilized in industry, are: "candelilla," "gobernadora," "lechuguilla," of which there are immense quantities in the different sections of the State.

Not much *game* is found in Coahuila; the animal that calls the attention of hunters mostly is the "berrendo" or wild goat (*antilicarpa americana*). The solitary region of the Muovano Sierra is the place preferred by hunters. Wild duck, crane and white heron are hunted in the vicinity of the Parras and Mayran lagoons.

Fishing is of no importance in this State.

COLIMA

Plants of commercial and industrial application, besides those mentioned in the chapters on Agriculture and Forests, are: "copalxihuitl" (*myrica xalapensis*), "guayul" (*vauquelina corymbosa*), "hierba del borrego" (*stevia eupatoria*), "llora sangre" (*bocconia arborea*), "tecocochoitl," "zabila" (*aloe vulgaris*).

There is plenty of *game* in the State, comprising puma, tiger, coyote, wolf, bear, otter and other animals, from which splendid skins can be obtained.

Fishing is engaged in along the coast and in the rivers Cohuayana, Armeria and Cihuatlan; it comprises the following species: "tintorera" (*sphirna zygaena*), "liza" (*mugil cephalus*), "palometa" (*vomer setipinnis*), "mojarra" (*xysteoma cener-eum*), "jiniguano" (*lytrulon flaviguthatum*), "mojarra de aletas amarillas" (*gerres peruviana*),

"mueca" (*chaetodon humeralis*), sardines (*goodea atripinnis*), etc.

DISTRITO FEDERAL

The commercial plants are those which we have indicated in the chapter on Agriculture. Those of industrial application growing in the District are insignificant, since such plants are rather imported from other sections of the Republic to be used in different industries established in the Federal District.

Game in the District is very limited. Only in the sierras of the Ajusco, in the fields and hilly sections of Xochimilco and Milpa Alta is hunting done, comprising coyotes, mountain cats, "cacomixtle" (*basaris sumicrasti*), ducks and herons. But there is no abundance of such game.

Fishing is of no importance in the District.

DURANGO

The plants of commercial value are those which we have mentioned under the heading of Agriculture. Those of manufacturing value are: "guayule," a rubber-producing shrub which grows in a wild state in the eastern and northeastern sections; the "candelilla" contains wax in its tissues and grows spontaneously in the calcareous sections, East and North-east; the "lechuguilla" produces a very strong fiber; the "gobernadora" contains substances for the manufacture of explosives, which makes it a plant of great potential value for manufacturing purposes. The "canapis" plant is used for cattle feed, for the manufacture of brooms, and is also grown for birdseed; the "guayul" or "palo prieto" tree yields a good tanning material.

In the forests and valleys of the State there is large *game* as well as small. Coyote hunts are organized on a large scale and as many as fifty of these animals are often caught at one time, and the skins taken. On the Mapimi, Cuencame and Inde steppes, the "berrendo" or "bura" is hunted, of which both the skin and meat are used, as well as the horns, from which ornamental articles are made. On the high plateaus of the Sierra, from Suchil to Tamasula and Santiago Papasquiare, people hunt deer (*cariacus tolteca*) from the month of August to November. Hunting is also engaged in throughout this section for wolves, the brown bear and even the silver bear. In the ravines are found the long-tailed wild cat (*felis tigrina*) and the short-tailed wild cat (*felis rufa*), the "chiriduyo" (*felis pardalis*), the puma (*felis concolor*) and the tiger (*felis onza*, ounce). Hare and rabbit are hunted in the plains. The duck, white heron and the blue heron (*ardea candidissima* and *ardea cerulea*) are the most prized among the birds; the "cocono salvaje" (*meleagris gallopavo*) and the quail (*gallipepla scamatia*) which exist in enormous quantities, are also hunted.

GUANAJUATO

The soil of Guanajuato is rich in vegetal species, many of which grow spontaneously and in great abundance. Many of these have been indicated in dealing with agricultural and forestal products. Here we have: "candelilla," "estafiate" (*artemisia mexicana*), "guayul" or "palo prieto" which produces tannin, the same as the "cascalote," "hoja pinta," "ixtle," castor-oil plant, white-mulberry tree, "norote," "oregano," olive tree, "manzanilla" (ma-

tricularia chamomilla), "peyote," "poleo," "peru" (schinus molle), "rosilla" (helenium mexicanum), "salvilla" (buddleia scordiodes), "toronjil" (dracocephalum moldavica), "toloache" (datura stramonium), "tule," valerian (valeriana mexicana), "zabila" (aloe vulgaris), "yerbaniz" (tegetes lucida), "yerbabuena" (metha viridis), "costicpatle" (thalictrum hernandezii), the root of which contains a coloring matter; "nextamalxochitle" (ranunculus dichotomus), which is a caustic; "palo amarillo" (berberis pinnata), also called in the country "cachisda"; it contains a coloring matter; "chicalote," "llora sangre" (bocconia arborea); this plant contains alkaloids of anaesthetic qualities.

Hunting constitutes an attractive sport in this section, *game* being plentiful. The species that are hunted mostly are: deer, rabbit "comadreja" or weasel (mustela brasiliensis), "conepatl" (conepatus mapurito), coyote, "coyemetl" (dicotyles tajau), "mapache" (procyon lotor), "oztohua," a kind of fox (vulpes virginianus) and other species which are hunted either for their skin or meat or just for the sake of exterminating them as injurious beasts.

Fishing is engaged in along the rivers and the lagoon of Yuriria, but is of no importance.

GUERRERO

There are in this State numberless plants—and the same is true in the other sections of Mexico—which are either altogether unknown or very little used in commerce or industry. But there are many others that are well known; among those that have not been described in other chapters are the following: "copalchi" (couteria latiflora), a tree the bark

of which is used for its medicinal value in combating the endemic fever of this region; the "ocotillo" (*fouquiera splendens*), from which a resin is extracted; "copal santo" (*bursera jorullensis*), of which the incense used in the churches is obtained; "pinoncillo" (*jatropha curcas*), which yields a strong and very dangerous purgative; "codo de fraile" (*thevetia yecotli*), a venomous plant; "cuau-tecomate" (*parmentiera alata*), a medicinal plant used in diseases of the respiratory tract and for the cure of diarrhea; "napahuite" (*trichilia hirta*), the seeds of which contain forty per cent of oil; "coyol real" (*oreodoxa regia*), which produces a fine oil; "paracata," the bark of which contains a large amount of tannin; "pie de cabra" (*bauhinia*), a very strong wood containing dyestuffs; "jotlatia" produces an irritant resin; its wood is scarcely ever attacked by woodlice; "mataratas," a tree the bark and flowers of which are used in manufacturing a rat-killing stuff; "palo del brasil," a dyewood; "cabeza de viejo" (*cephalocereus chrysacanthus*), a textile plant; "hierba del borrego" (*stevia eupatoria*), used as a remedy against malaria; "majagua" (*hibiscus tilicens*), a textile plant; "tepozan" (*buddleia humboldtiana*), and many other species that are mentioned in other parts of this book.

Game is abundant in the State. There are several species of deer; rabbits, also various species; bear, wolf, puma, "mapache" (*procyon lotor*), otter, "frijolillo" (*felis pardalis*), "jabali" or wild hog (*dicotyles labiatus*); lynx (*felis rufa*), "martucha," (*cercoleptes caudivolvulus*); ounce (*mustela brasiliensis*), "oztohua," a species of fox. These and other animals are hunted in the State of Guerrero. Most of the skins, some of which are very fine, get

lost because the people do not know how to preserve, prepare or tan them. As to birds, a great variety of them is hunted, as for example the wild turkey or "guajalote" (*meleagris ocellata*), the "chachalaca," a kind of wild fowl (*ortalis vetula*), the eagle (*aquila crysaetos*); various kinds of "abejero" (*oiranga aestiva*, *myobius sulphureipygus*, *tyranus crassirostris*), a bee-eating bird which does a great deal of harm.

Fishing is actively engaged in along the coast and rivers, the species of fish being the same as those found in the State of Guanajuato.

HIDALGO

The flora of this State shows that there are two well-defined regions in the State; one class of vegetation is that of the plains where the "pulque" agave plant abounds, and the other is that met with in the plains of Tula, Tulancillo and the section of the Huasteca region belonging to this State. Multitudes of plants cover the soil, and many industries could be established to utilize the indigenous products of this section. In the region where maguey or agave grows, and which for that reason is also suitable for other species of the same genus, there are the ixtle agave, the agave of the highlands (*agave asperuna*) and other fiber-producing plants. The "candelilla" grows in the plains of Hidalgo as it does in those of the State of Puebla, there being the species called "*euphorbia cerifera*," which is very little different from the "*euphorbia antisyphilitica*" mentioned in the descriptions relating to other States, and is a good textile plant; the "oregano," which produces an antirheumatic substance; the "peyote"

which contains an excitant of possible medicinal application; and a large number of other plants which could be made the basis of flourishing industries. All the plants which we have mentioned and many others, would furnish the raw material for important industries, as they exist in enormous quantities.

Hunting is carried on in the State, especially of the animals of the torrid zone in the Huasteca section, such as: the puma, ounce, "tigrillo," a large-sized tiger-cat. In Tula, Tulancillo, Tenango and other similar localities, deer are hunted, and although these are daily becoming more rare, they are by no means extinct, as they are particularly adapted to the climate, soil and food in these sections of the country.

JALISCO

In the southern section of the State, near the State of Colima and the coast, the plants are of the tropical kind. Towards the boundary with the State of Nayarit there is an abundance of "ramie" (*boehmeria nivea*) which people try to utilize in the textile industry in the city of Guadalajara; then there are the following plants: "maguey bravo" (*agave cupreata*), growing in the vicinity of the volcanoes and which could be utilized in different industries; "azafrancillo," "anil" or indigo-plant, "aconito" (*ranunculus dichotomus*), "anisillo," "amole de bolita" (*sapindus marginatus*), containing much saponin; "abrojos" (*koeverlinia spinosa*), *arnica* (*heterotheca inuloides*), "anisillo" (*tagetes micrantha*), "amole" (*procyanthes viridescens*), "bonete" (*illeus heptaphyllus*), "bruja" (*bryophyllum calycinum*), "borraja" (*cordia boissieri*),

"balsamo" or balm (*myroxylon pereirae*), "chia," "chilte," "candelilla," "canapis," "chicalote," "coyol baboso" (*acromia mexicana*), "clavellina" (*bombax palmeri*), "copal santo," "colorin" (*erythrina collarodendron*), "colorin chiquito" (*rhinchosia precatoria*), which is utilized in the manufacturing of corks; "llora sangre" (*bocconia arborea*), a dye plant of anaesthetic properties; "cuajilote" (*parmentiera edulis*), "espuelas de caballero" (*delphinium leptophyllum*), "estafiate" (*artemisia mexicana*), "granadilla" or "jarrilla de Guadalajara" (*mocinna heterophylla*), "guasima," "jaboncillo" (*sapindus* sp.), "hinojo" (*foeniculum vulgare*), "hierba buena" (*mentha rotundiflora*), hoja-sen (*fluorencia cernua*), flax, white-mulberry tree, "mezquitillo" (*cassia occidentalis*), "ninfa blanca" (*nymphaea alba*), "oregano," "peyote," "pata de liebre" (*ochroma lagopus*), a textile plant, much used for the manufacturing of hats; "pinguica" (*acrostaphilus pungens*), "pegarropa" (*mentzella wrightii*), "rosilla" (*helenium autumnale*), "zabila" (*aloe vulgaris*), and many other plants which still have to be studied in order to determine their industrial value.

The State of Jalisco offers splendid opportunities for *hunting*, since there is plenty of deer, especially in the northern section and also of rabbits, hare, coyote, wolf, brown bear, silver bear, puma, tiger, wild fowl or "chachalaca," etc., etc.

Fishing is of no great importance in this State, being engaged in in the rivers and in the lake of Chapala; the fish caught mostly are: the small sardine (*goodea atripinnis*), "bagre (*amiurus dugesi*), "pescado blanco" (*chrosoma estor* Jordan), "lamprea" (*lampetra spadicea*), etc.

MEXICO

Nearly everything that can be said concerning the flora of this State is already contained in the chapters on Agriculture and Forests. As to industrial plants it may not be amiss to repeat the names of a few that offer the best chances of being industrialized, as soon as their usefulness is thoroughly understood. These plants are: the maguey for the extraction of the so-called "ixtle" fiber, the "zacaton" the root of which could well be exploited in the manufacture of brooms, brushes, etc.; the white-mulberry tree, the further growing of which would help the development of the silk-manufacturing industry, already in existence to some extent and apparently yielding very satisfactory results; the "carrizo" and the "taray," the reed of which has an extensive industrial application. Then there are in the State considerable quantities of plants, the fruits and seeds of which could very well be made the bases for a prosperous oil-producing industry, as for example, the peanut, the olive, etc.

The State offers a fairly good *hunting* ground. The regular hunting season includes the months of September and October. The game includes deer, ounce, puma, tiger or leopard, mountain cat, skunk, coon and other species, offering splendid hunting for the sportsman as well as for the professional hunter.

Not much *fishing* is done in the lakes of the State, although there is a good market for the product; it is more active in the lake of Xochimilco.

MICHOACAN

The chief industrial plants of Michoacan are: sugar-cane, tobacco, flax, indigo, cotton, "ixtle,"

tan-bark trees, sesame, vanilla, rubber-trees, mezcal, grape-vines, olive-trees, mulberry-trees, "zacaton" (a coarse grass), and a number of others, all in enormous quantities, so much so that the organization of important industries could be made profitable.

Game is plentiful; on the Southern Plateau there are animals of the torrid zone, such as puma, "tigriльо" or tiger-cat, the "ocetotle," ounce, and others with beautiful skins, greatly appreciated by those interested in such articles; deer abound mostly in the Northern Plateau.

Fishing is of great importance in the lakes of Patzcuaro and Chapala and in some of the rivers of the State, such as the Marques, the Tepalcatepetl, the Balsas and the Zacatula which is the lower course of the Balsas river. Only the lakes of Patzcuaro and Chapala have near-by markets. The principal fishing place on the Chapala is Sahuayo.

MORELOS

The State of Morelos possesses an immensely rich flora, as one can easily gather from our statements concerning agricultural and forestal conditions. Most of the calabash which when dried is used as a vessel for the juice of plants in many of the States is a product of the "lagenaria vulgaris," very abundant in Morelos; other industrial plants grown in this State are: "anil"—indigo, sesame, "capomo," "chilte," "cana fistula" (cassia fistula), which has medicinal value, "cuajote" (bursera aptera), the gum or resin of which is generally used for gluing broken glass and crockery; yucca, locally also known under the name of "guacamote"; "bonete" (phileus heptaphylles),

"mangle rojo" (*rhizophora mangle*), a tanning material; "ocotillo" which yields good resins; cedar, the resin of which is used in the preparation of remedies against bronchitis; "hierba de la cucaracha" (*haplophitum cimidum*), which is an insecticide; "codo de fraile" (*thevetia yecotli*), which contains poisonous substances; "nacaxtle" (*pithecolobium* sp.), used against the bites or stings of venomous animals; sarsaparilla (*smilax* sp.), of well-known medicinal properties. The flora of this State is identical with that of the States of Puebla and Oaxaca to which we refer the reader for further details concerning the matter. There is a plant in this State which deserves special mention; it produces glass-like beads, fairly strong and of a blue color, which the Indians use for making necklaces and similar things; the plant is called "lagrima de San Pedro"—St. Peter's tears (*caix lachryma*).

Game is plentiful in this State and comprises fine fur-clad beasts, such as pumas, tiger-cats, leopards, jaguar (*felis jaguarundi*), bears, otters, "cacomixtle" (two species: *basaris astuta* and *basaris sumichrasti*), foxes, wolves, etc. Among the birds we must mention the "aguila caudal" or eagle (*aquila crisaetus*), one of the largest species in the country. Many places in the State such as the towns of Cuernavaca and Cuautla are named after this bird. The common name among the Nahuatlacan Indians for Cuernavaca was Cuauhuahuac, signifying "the place where the eagle's voice is heard."

No *fishing* of any importance is carried on in the State; it seems that the people care a great deal for the hunting sport, being very little interested in the fishing trade, which could be engaged in in the large rivers.

NAYARIT

There is a rich and varied flora in the wooded ravines, valleys and islands of the State of Nayarit. The soil holds a multitude of medicinal, textile and other plants. Many species have never been studied and nothing is known about their possible application for commercial or industrial purposes. The following are some of the industrial plants that grow plentifully in this region: "amapolita morada" (*cenothera rosea*), which grows in the plains; "anilina" (*phlox drumondii*), "acocote" (*prionosciadum mexicanum*), various species of rubber-trees, "arce" (*acer campestre*), "arnica" (*heterotheca inulides*), "amole," "borraja," "balsamo," "clavellina" (*bombax palmeri*), another species of "clavellina" (*pachira*), "copal chino" (*bursera bipinnata*), "copal santo" (*bursera jorullensis*), "cicuta" (*conium maculata*), "colorin chiquito" (*rhinchosia precatoria*), "colorin" (*erythrina corallodendron*), "cuapinole" (*hymenaea courbaril*), "cana fistula" (*cassia fistula*), "copalchi" (*coultarea latifolia*), "cocolmea" (*smilax rotundifolia*), "cebadilla" (*schoenocaulon*), "canamo" (*cannabis sativa*), "chachaca" (*grymis winteri*), "estrellita" (*milla biflora*), "guasima" (*guazuma polibotrya*), "gordolobo" (*guaphalium canescens*), "jaboncillo," "mostaza" (*brassica nigra*), "otate" (*guada* sp.), "marihuana" (*cannabis indica*), "marrubio" (*marrubio vulgare*), "otatillo" (*chusquea*), "peyote," "peru," "pochotes," "pata de liebre," "pinguica," "pegarropa," "rosilla," "tronadora" (*tecoma stans*), "yerbanis," "zacate de aparejo" (*sporobolus utilis*), "zopilote" (*swietenia mahogani*).

Game includes large species, such as deer, brown

bear, silver bear, wolf, puma, ounce, a species of otter (*lutra felina*), mountain cat, etc. Among the birds we have the wild turkey, a kind of wild fowl, called "chachalaca" (*ortalis vetula* and *ortalis policephala*), raven (*corvus corax*), "corre camino" (*geococcyx affinis*), "cuitlacoche" (*harporhynchus quail*), "coa" (*trogon mexicanus*), "agachona" (*galinago delicate*), "coquita" (*chamaepelia minuta*), "faisan griton" (*crax globicera*) a kind of pheasant, "guacamaya" (*are militaris*), macaw; "huilota" (*zenaidura macrura*), "martin pescado pardo" (*cerile alcyon*), "mulato" (*melanotis caerulescens*), "torcaz" (*columba leucocephala*), "pito real" (*trogon mexicanus*), etc., etc.

Much fishing is done on the Pacific coast, especially near San Blas, the following fish being caught mostly: "aguja" (*fylosurus fordior*), "mojarra" (*xystoema cenereum*), "chopa rayada" (*lagodon rhomboides*), "raya" (*urolophus halleri*), etc. Shrimps and oysters are caught in the lagoon of Mexcaltitlan.

NUEVO LEON

Besides the species of plants having industrial application, mention of which has already been made in the chapters on Agriculture and Forests, the following deserve special notice: "zacate de aparejo" (*sporobolis utilis*), "zacate de escoba"—broom grass (*muhlenbergia disticophylla*), common palm (*phoenix dactilifera*), "yerbanis," "tomillo" (*thimus vulgaris*), "sangre de grado" (*jatropha spatulata*), "rosilla" (*helenium automale*), "ramon blanco" (*trophis americana*), "palma samandoca" (*yucca australis*), "palmito" (*yucca treculeana*), "palma de San Pedro" (*sanuela carnerosana*),

"viznaga," "pitahaya," "garambullo," "oregano," "otatillo" (*chusquea* sp.), "ocotillo," "ojaranza" (*carpinis betulus*), nettle, "chascalote," "nanche," "cabeza de negro" (*nymphaea ampla*), "ninfa," "maguey bruto" (*agave asperuna*), "maguey cenizo" (*agave quiotifera*), "hinojo" (*foeniculum vulgare*), "chamal," "bonete," "azafrancillo."

Game is not very abundant; there are, nevertheless, deer, a kind of wolf called in the country "xoloitzcuintli," beaver (*castor fiber*), "puerco juin" (*taxidea americana*), "moto" (*spermophilus mexicanus*), "mapache" (*procyon lotor*), "leoncillo" (*felis eyra*), short-tailed mountain cat (*felis rufa*), "corralero" (*felis pardalis*).

Fishing is done in the Salado river, especially of the river pearl oyster (*unio digittatus*), the river mother-of-pearl oyster (*lampsilis berlandieri*), and another species known under the name of "concha palola" (*quadrola heros*).

OAXACA

Although we have already given an idea of the wealth of flora of the State of Oaxaca, we will mention here in a cursory manner the species which could at once be utilized commercially and industrially: different rubber-yielding trees, indigo, tobacco, sapodilla, saffron (dye matter), quinine bark trees, "machiche," balm, mallow, marshmallow, "anisillo," "copalxihuitl," "cabeza de viejo," which is a textile plant, "devil's brush" (*cumbretum jacquini*), "cua-jiote" (*brusera aptera*), yielding gums, resins, varnishes; Chinese copal, "copal santo," "linaloe" (*aloe*), "hoja pinta," a textile plant; bean of St. Ignatius (*hula crepitans*), "ixtle," "majagua,"

(hibicus tilicens), "nispero" (eribobrya japonica), palm (brahea dulcis), a textile plant; "pita," a textile; "tecocochitl" (cachlospermum ibiscoides), producing a delicate fiber which is excellent for padding or filling; sarsaparilla, "yoyote" (thetia nerii-folia), "yoloxchitl" (talauma mexicana), which is used as medicine for heart troubles.

All these are plants which only await an opportunity to offer material for flourishing industries.

Game is as plentiful in this State as it is in the State of Chiapas, with the difference that some species which are scarce there, are common in this section, such as bears, wolves, coyotes, tigers, also called "ocalotl" and "huiduri," pumas, otters and others.

Fishing is not of particular interest. It is only near the ports that any of it is done. Sponges are dived for at the ports of Salina Cruz and Puerto Angel, although to a much smaller extent than on the coast of the State of Chiapas.

PUEBLA

The most interesting industrial plants growing in this State are the following: "azafrancillo," which produces a valuable oil; "amate" (ficus nymphaeifolia), used as medicinal plasters; "chicalote," which yields oil; "candelilla," producing wax; "copalxihuitl," another wax-producing plant; "guajiote" (bursera aptera), growing in the region of Chi-autla; it is a poisonous plant yielding gum, resin and varnishes; "copal," "copal santo," both producing incense; "linaloe" from which aloe is extracted; "estropajo" (luffa cylindrica), yielding mat-weed; "estafiate" (artemisia mexicana), of which a volatile

oil, resins and an anthelmintic fluid is extracted; "guasima," the bark of which produces a good fiber; the castor-oil plant, "ixtle," "jonote," a textile plant; "sangre de toro" (*spigelia longiflora*), a poisonous plant which could be used in medicine; "salvia" (*buddleia perfoliata*), used as a remedy against profuse sweating; "valeriana" (*valeriana mexicana*), growing plentifully in the region near the Valley of Mexico, being used in medicine as an antispasmodic.

There is *game* in various regions of the State; deer in the northern section, and other species of large game in the southern parts of the State.

Fishing could be engaged in to a larger extent in the rivers.

QUERETARO

The State has large plains such as those of Cazadero, San Juan del Rio and Queretaro, this latter belonging to the region called "Bajio"; in these plains a considerable number of plants grow which could be utilized in different industries. No use is made in this State of the "candelilla" of which there are large quantities; then there is plenty of "azafrancillo," "anemona," "anisillo" (two different species), "azafran," another "azafrancillo" (*carthamus tinctorius*), "aconito," "barbas de chivo" (*clematis dioica*), "borraja" (*cordia biossieri*), "chia cimarona" (*salvia pseudo chia*), "cadillo," "chicalote," "cerraia" (*taraxacum dens-leonis*), "contrayerba" (*psoralea pentaphylla*), "damiana" (*thurnera aphrodisiaca*), "escoba," "estafiate," "ixtle," "hierba buena" (*mentha rotundifolia*), "mostaza," "norote," "otate," "oregano," "salvilla," "rosilla," "taray" (*eisenhardtia orthocarpa*), "te" (*bidens tetragona*), "toronjil," "zabila," and a number of

other plants that can be industrialized in one way or the other.

Hunting in this State offers excellent opportunities; the following animals are found: deer, "albardon" (*conepatus mapurito*), black squirrel (*sciurus variegatus*), several other kinds of squirrels, "ardillon" (*spermophilus grammurus*), rabbits, hare, "mapache" or "tejon" (*procyon lotor*), fox, etc.

Many different species of birds are found in the forests, the most coveted of which is the wild turkey.

QUINTANA ROO

As we have already stated in another chapter, little is known concerning this territory; the land is not fully explored and only very small tracts are cultivated or partly exploited in other ways. The flora, of course, includes all those plants and trees which as a rule are found in tropical forests.

The Indians of Quintana Roo are quite fond of hunting deer, rabbits, wild hogs, wild turkeys, and quails; pumas, tigers or leopards, tiger-cats, macaques and a number of other animals abound in the forests. In the estuaries several species of ducks, white herons, flamingoes and alligators are found.

There is an abundance of fine fish along the coast. Lobsters, crabs, oysters, calamaries and pulps are also plentifully found.

SAN LUIS POTOSI

The flora of San Luis is rich and varied, according to the three completely different zones which compose the State. The plants of present commercial and industrial application are already described

in other parts of this book; special attention should be called, nevertheless, to different plants, such as the "ixtle," or fiber of the "lechuguilla"; the prickly-pear tree which produces a fruit from which the popular "tuna" paste or jelly is prepared.

Hunting is especially carried on in the tropical section of the State. In the valleys nearly all kinds of game have disappeared, and there is scarcely any left in the Salado section. In the Huasteca region many animals are hunted for their beautiful skins, as for example the puma, tiger, mountain cat and other species. This class of hunting is not without danger, but preferred by sportsmen for this reason.

Fishing is carried on in the Huasteca section of the State, although as an industry it is not very important.

SINALOA

In order to give complete data in this chapter about the flora in the State of Sinaloa—and this is true also with regard to the other sections or States of Mexico—we should have to repeat all we have said regarding agricultural and forestal products. Some of the following industrial plants have already been mentioned before, others are less known or have been little used for industrial purposes; they are: "guapilla," which yields an excellent fiber; "chilte," which also grows plentifully in Nayarit and Jalisco and produces a gum similar to that employed in the manufacture of chewing gums; "ramie," a fiber-producing plant; flax, the useful fiber of which should be industrialized, for up to the present time, here as well as in the State of Sonora, the seed is made use of in the making of oil, and the fiber-yielding parts are thrown away; lechuguilla, the

ixtle-producing plant, grows plentifully in the State; furthermore, yucca, anil, "orchilla," sesame, "amate," "azafrancillo," "jaboncillo," "amole," "calabacilla hedionda" (cucurbita foetidissima), "albahaca" (ocimum basilicum), "peyote," "borraja," "bonete," "balsamo," "camichin," "carrizo," "cuau-tecomate," "chirimoya," "coquito de aceite," "came-lote," "clavellina," "colorin," "tabaquillo," "mos-queta," "linaloe," "nanche," "norote," "pinon," "palo de brea" (circidium unijuga), "palo amarillo," "palma de San Pedro," "palo de rosa," "palo de fierro" (brya ebenus), "retama" (cassia laevigata), "romero" (rosmarinus officinalis), "toloache," and different species of "zacate," or coarse grass, from which a number of articles can be manufactured or prepared, as medicinal beverages for example.

Hunting is abundant in the State: among the large mammals we have: pumas, leopards, deer, brown and silver bears, wolves, short-tailed mountain cats, wild boars, otter, "mapache," "tejon" (nasua narica). Then there are rabbits, hares, different kinds of squirrels, etc. Among the birds we have: eagle (buteo borealis), wild turkey, wild fowls, quail, white heron, blue heron, several species of falcons, several kinds of macaws and parrots. Then there are quite a number of fine singing birds.

Fishing is abundant and comprises principally "cabrilla de artillero" (mycteroperca jordani), "chopa rayada" (logodon rhomboides), "tiburon volador" (carcharias aetalurus) and many other species.

SONORA

Besides the plants and trees that have been mentioned in other chapters, the State produces all such

plants as grow in the hot zone. There are: "ajonjoli," or sesame, "bonete," "peyote," "aciote" (*bica orellana*), "borraja," "bruja" (*eschscholtzia californica*), "boochic" (*cephalanthus occidentalis*), flax, sorghum, "cadillo," "cundeamor" (*momordica charantia*), "chilacayote" (*cucurbita ficifolia*), "chayote" (*sechium edule*), "cerraia" (*taraxacum dens-leonis*), "chintoc" (*hymenaea* sp.), "escoba," "garambullo," "zacocon" (*tabebuia guayacan*), "jojoba," "huamuchil," "hierba del borracho," "mimbre" (*chylopsis saligna*), black mustard, nettle, "otate," "otatillo," "ojaranza" (*carpinus betulus*), "pajon" (*sporobolus wrightii*), "pino de azucar" (*pinus lambertia*), "pinon" (*pinus cembroides*), "pino real" (*pinus montezumae*), "pitahaya," "toloache" and a good many other species.

There is still plenty of *game* in the State; it is one of the few regions where far into the sierras and in the most solitary places buffaloes are still encountered, but they are becoming rarer every day; silver bear is more abundant in Sonora than in any other section of the country; brown bear is plentiful; pumas and other species of large game are also found.

The *fishing* trade is quite active along the coast; the species of fish and other aquatic animals found here are about the same as those that prevail along the coast of Sinaloa.

TABASCO

We must repeat with regard to flora that, in order to give a detailed statement of all the plants growing in Tabasco, it would be necessary to enumerate an infinite number of names. We will therefore mention only the names of those species which

are of special industrial value. First of all there is the cocoa-plant from which the well-known fruit product as well as wine, cream, fiber are obtained. Then there is the indigo-plant which is abundant and from which an excellent dye material can be obtained; the same applies also to the "achiote" plant; then there are large quantities of the different species of rubber-trees; the "anona palustris," of the very same quality as exists in the State of Campeche and which is a substitute for cork; the quassia of Jamaica (*picrasma excelsa*), from which a tonic is obtained; the sapodilla-tree, from which the gum used in the chewing-gum industry is extracted; the "guasima" (*guasuma polibotrya*), which, besides yielding an excellent wood, also furnishes textile material, that is, the bark of the tree; various kinds of lillies, from which paper can be made; the "macallo" (*andira excelsa*), from the fruit of which a flour is made, which can be mixed with that of corn or wheat; the bark of this same tree is frequently used as a remedy for malaria; the two kinds of "pochote" which are cotton-producing trees; there is in England an enormous demand for the product of these trees; vanilla, which is in large demand in the country and abroad. There are whole forests of "palo de moral" (mulberry-tree) and of numerous other species of trees which can easily be industrialized.

The State of Tabasco abounds in every class of animal life. It is a beautiful sight to see numberless cattle grazing in the flats. Many kinds of wild animals belonging to the torrid zone live in the forests.

Hunting is only occasionally engaged in by the people, although game is plentiful.

Fishing also is practised in the rivers, lakes and lagoons, as well as on the coast, where it is not a rare sight to see fishermen engaged in one of the commonest occupations of the Veracruz coast, viz.: "manattee" or seacow fishing. Several species of alligators abound in the rivers, but more so in the lagoons and estuaries.

TAMAULIPAS

The flora of the State of Tamaulipas, as far as its southern section is concerned, is similar to that of the Huesteca region of the State of San Luis Potosi; that of the central and northern section is much like the flora which prevails in the State of Nuevo Leon. The following vegetal species, as already mentioned in other parts of this book, offer splendid material for the establishment of permanent industries: "ceiba" (*eriodendron grandiflora*), brazil-wood, campechea-wood, the different species of rubber-trees, "chilte," "amate," "azafrancillo," "algodoncillo" (*inga* sp.), "brasilete," "chicalote," "chachamole," "copalxihuitl," "chijol," "cuaulote" (*beliocarpus americanus*), hemp (*cannabis sativa*), "chachaca" (*grymis winteri*), "engordacabras" (*dalea tuberculata*), striped ebony (*diospyros velutina*), "mulatto ebony" (*calliandra formosa*), "granjena," "ixtle," "jalapa" (*spomea purga*), "hoja pinta" (*samsevieria zeylandica*), "norote" (*epicampes macroura*), "oregano," "ojaranza" (*carpinus betulus*), "pajon," "parota," "peru," "palmito," "palma" (*yucca filamentosa*), "quina falsa" (*exostema caribaeum*), "zapupe," sisal hemp (*agave rigida*), "lechuguilla," sarsaparilla, "cedro" (*cedrela odorata*).

There is plenty and varied *game* in this State, including deer, puma, ounce (*felis onca*), mountain cat, rabbit, hare, and some other species.

The *fishing trade* is very active in the Gulf of Mexico and in some of the rivers of the State. In the Conchas river the mother-of-pearl oyster and the tortoise-shell turtle are caught; other species include: various species of sharks (*carcharias platiodon* and *c. falciformis*), "cazon" (*carcharinus cethalorus*), "esmarrida" (*smaris vulgaris*), "rabirrubia" (*ocyurus chrysurus*), "huauchinango" (*lutjanus blackfordi*), "salema" (*archosargus unimadius*), "mojarritas" (*geres mexicanus*), "robalo comun" (*labrax lupus*), "gallineta" (*serranus sp.*), shrimps, dolphin seal (*manochus tropicalis*), manatee or seacow (*manatus australis*), large oysters (*ostrea fron*), oysters (*ostrea virginica*) and *lamp-silis luteolus*.

TLAXCALA

There is a great variety of plants in the large valleys of the State, the industrially valuable being: "maguey," which besides furnishing the beverage known as "pulque," yields a fiber and can be used for the manufacture of paper; "tule" (*thipha angustifolia*) grows on the shores of the Xonecuila lagoon and can be used for various manufacturing purposes, such as the making of mats, common chairs, bottle-casings, etc.; reed-grass (*arundo donax*) is also found in the lagoon and is useful for certain small industries; osier (*chyloopsis saligna*) is already used industrially, and so is "taray" (*salix taxifolia*), the "candelilla," bass or esparto grass (*luffa cylindrica*), "estafiate," "ixtle," "jonote," which is a textile plant; valerian, "broom grass," "zacaton."

There is relatively little *hunting* in the State; of what little there is, may be mentioned: the famous rabbits of the Volcano (*romeolagus diazi*), hares, deer, coyote. They are not very numerous, however. In the Xonacuilá lagoon there are wild duck.

The *fish* consist of small sardines and some "huauchinango" (*lutjanus blackfordi*).

VERACRUZ

The flora as well as the fauna of this State are extremely rich; they contain numberless species. As to the plant varieties we mention only those plants which have not been especially mentioned in the chapters on Agriculture and Forests; "yuca" or "guacamote" (*manihot utilissima*), which is eatable; "mangle rojo" (*rhizophora mangle*), containing tannin; "ocotillo," producing a resin; "alampeche" (*entada scandens*), which grows along the seashore and is extremely poisonous; "peru," which produces a gum; pulverized it is applied to ulcerating surfaces and to the unhealthy gums of the mouth; "pinoncillo" (*jatropha curcas*), a very active and dangerous purgative; "capomo," a very useful fodder for the cattle; "coyol baboso," very useful in the manufacture of paper; "nacaxtle" (*pithocolobium* sp.), used against the bites of poisonous animals; "zapupe," growing plentifully in the Huasteca region of the State; it is an excellent textile plant; "ramie," "amate," "chilte," which produces rubber; "capalxihuitl" and the "candelilla," both of which produce an excellent wax; "cuapinole," castor-oil plant, both of which produce oil; "haba de San Ignacio"—St. Ignatius bean (*hula crepitans*), very poisonous; jalap, "malvavisco" (*sida carpinifolia*), both medic-

inal plants; "peine de mico" (apeiba toburbou), cotton-trees or "pochote," of which there are several species yielding cotton; "tecoscochitl," a fiber-producing plant which has not yet been botanically classified, not at least definitely. There are numberless other plants, trees, shrubs, etc., very little of which is known and that will probably have some industrial or commercial application in the future.

Game is very abundant in the different sections of the State and includes several kinds of wild sheep, tapir, puma, leopards, different kinds of mountain cats, and in fact all such game as has been mentioned in the case of other States that lie within the tropical zone. Typical of this region are "hoco," a species of pheasant (*crax globicera*); "garza habada," a kind of heron (*tigrisoma cabanisi*); "huitztlaucuache" (*coendu americanum*); "conejo de Perote"—Perote rabbit (*lepus verae crucis*); "cojolite" (*penelope purpuracens*), in the vicinity of Jalapa, especially.

Fishing constitutes one of the common occupations of the people of the State of Veracruz, especially of those that live along the coast. Fishing is also engaged in in the large rivers of the State. The species of fish are the same as those mentioned in dealing with other States on the Gulf of Mexico. Several species of fish and alligators are caught in the Gulf, rivers, lagoons and estuaries.

YUCATAN

For the plants and trees of commercial and industrial value in this State, we refer the reader to the chapters on Agriculture and Forests.

The Yucatan people are exceedingly fond of flowers and pay a great deal of attention to the cultivation of these in their gardens and all available pieces of ground.

Hunting is practised mostly on the grounds of the large plantations where a permit of the owner of the plantation is required. In the forests of the State there are deer, wild hogs, rabbits, hares, armadillos, tigers, tiger-cats, pumas, quails, wild turkeys and other animals. An abundance of ducks, herons, alligators are found in the swamps, lagoons and estuaries.

The sea along the Yucatan coast abounds in excellent fish, of which there is a great variety, as well as of shellfish, turtle, etc. Fish deserving special mention are: "mero," a variety of the Mediterranean bass, the pompano, the "huachinango," the ruffle, a fish resembling the salmon. Then there is an abundance of cuttle-fish, calamary, spiny, lobster, crabs and diverse species of turtles. In the estuaries we find the skate, the "pochitoque," a kind of green turtle, etc. Around the island of Alacranes the manatee is found, being a favorite game for hunters and fishers.

ZACATECAS

The plants of industrial application that grow in the State of Zacatecas, are: the sugar-cane, of which refined and brown sugar are obtained; "maguey," from which "mezcal" wine is made; "lechuguilla," which is very little utilized in the State; the "guayule," the whole plant of which is extracted for the obtaining of rubber; a kind of "palma," the fiber of which is used in the manufacture of cordage and

similar goods. All these plants are very abundant in the State.

Little *game* exists in this section of the country; some deer are found, coyotes, rabbits, hares and a few other species of game.

Fishing in this State is of no importance whatever.

CHAPTER XI

RAILWAYS—ROADS—MAIL—TELEGRAPH— TELEPHONE

Taken as a whole, the Mexican Republic has a fairly good network of railways; a number of States are well served, but others are entirely or very nearly so deprived of the enormous benefits which accrue from such modern and quite indispensable means of communication. In this case as well as in the other matters discussed in this book, we present all the conditions as they are in every single section or State of the Republic.

The principal railroad lines, such as those that lead from the principal ports to the interior of the country, and those proceeding from the City of Mexico, towards other important cities, offer under normal conditions fairly good facilities and comfort; Pullman cars travel regularly on the main lines.

The principal railroad companies of the country are the following: The Mexican International; the Interoceanic; the Mexicano; the National Railways of Mexico; the Southern Pacific of Mexico; the Veracruz & Isthmus with their diverse affiliated lines.

As to the capital invested in these utilities most of it is American and English.

Up to 1920 the lines in operation covered about 25,800 kilometers; some new lines are under construction and the building of others are projected. This matter is further explained in the paragraphs

referring to the different States. Since we indicate in this chapter all the railroad depots along the lines, these can easily be traced on the maps found in this book.

We take special care in indicating all such new railroad lines as could be built, so as to show to concerns interested in this kind of enterprise and investment, the opportunities offered in the different sections of the Republic.

In speaking of *highways* or *roads* we have particularly in mind those that are suitable for the traffic of motor vehicles, such as automobiles and trucks, etc. Many sections of Mexico, being greatly accidented, offer serious difficulties in the matter of building roads for this modern system of traffic. The Central Government of Mexico as well as the State Governments are doing earnest work in the way of building roads for automobile traffic; some new stretches of good road are continually added to those already existing, and there is no doubt that within a couple of years the country will possess an extensive system of highways of this kind.

We think that the building of automobile roads by private enterprise would be a paying proposition, the necessary arrangements or contracts to be made with the Federal or the State Governments, as the case may be. People interested in this line of business should not fail to further investigate the matter.

The *Postal Service* is very well organized in Mexico; even small villages have at least their mail agencies; all in all, there are about 3,000 post offices and postal agencies distributed all over the Republic.

Telegraph wires connect all places of importance. The total extension of the telegraph line system may

be estimated as covering about sixty-eight to seventy thousand English miles. The entire telegraph system is operated by the Mexican Government.

The *Telephone* service is in the hands of private concerns. The local telephone service may be called efficient, but the long distance telephone is not yet sufficiently developed.

The *Cable* service is carried on via Galveston. All foreign telegraphic service is carried on by this line and will be so up to 1929, the Mexican Government being bound by contract with the Cable Company not to send telegraphic messages to foreign countries by any other means.

Conditions in this respect will be much more favorable after that contract will have expired, for then the many *Wireless Stations* existing already in different sections of the country and those the construction of which the Government contemplates will be of great help in expediting rapid communication with foreign countries.

The wireless stations are wholly controlled by the Government and carry chiefly official communications, but private messages for places within the Republic are also transmitted; these conditions will prevail, as already stated, until the expiration of the contract with the Cable Company.

AGUASCALIENTES

Railways.—The lines which traverse the State of Aguascalientes are: the railroad from Mexico to El Paso, which passes from South to North and is 40 kilometers long within this State, with depots at Penuelas, Arellano, Aguascalientes, Chicalote, Las Animas, Pebellon, Rincon de Romos, Punta and Soledad.

The railroad from Aguascalientes to Tampico has an extension within the State of 83 kilometers, with depots at Chicalote, Canada, Callardo, El Tule, Loreto, Tauro and La Honda. The line from Rincon de Romas to Cobre covers 17 kilometers and has depots at Julian and at Tepezala.

New roads are needed in the western section of the State. The extension of the Tampico line westward would be of advantage for the transportation of lumber and the products of the cattle-raising industry.

Roads.—There are not many roads in the State of Aguascalientes that are suitable for automobile traffic; they will become necessary as soon as there are signs of increased economic development. An electric trainway serves the City of Aguascalientes.

The *Mail* service of the State is fairly good and letters from the Capital reach the farthest towns of the State in very little time.

Telegraph.—There are telegraph offices in the City of Aguascalientes, and also in Calvillos, Asientos, Tepezala and Rincon de Romos.

Telephone.—The Capital of the State has a rather limited telephone service.

BAJA CALIFORNIA

Railways.—Only one railroad, the Inter-California, serves a portion of this Territory, with stations at the following points: Mexicali, Packard, Pascualitos, Sesbania, Cocopah, Hechicera, Vulca, Batagues, Tecolote, Paredones, Cuervo, Dieguinos, Algonones; its extension is 83 kilometers.

Roads.—There are some highways, though not very long, between the principal towns and farms.

It would not be difficult to build good roads for the automobile traffic along the coast section which is flat.

Mail.—The postal service is deficient, for mail by maritime route is governed by the arrival and departure of ships, while the land routes are long and roundabout and require considerable time to reach the Territory.

Telegraph.—Telegraph stations are operated at La Paz, Mulege, San Jose del Cabo, Todos Santos, Santa Rosalia, and Mexicali.

Telephone.—There is no telephone service in the Territory.

CAMPECHE

Railways.—The State of Campeche enjoys the services of the West Division of the United Railways of Yucatan; this Division maintains regular service between Merida, the Capital of the State of Yucatan and the Capital of the State of Campeche. There are two other trainways operated with the aid of animals. One of these lines, called Campeche Railroad, maintains communication between the city of Campeche and the Uyamon plantation; the other line, called Lerma Railroad, runs to the small sea resort of Lerma. The reader will find all the details concerning the Merida-Campeche line in the corresponding paragraph of the discussion of railway facilities regarding the State of Yucatan. The Campeche-Uyamon line covers 30 kilometers and has stations at several villages and farms. This line, according to the concession granted, should run as far as the District of Los Chenes, but a considerable stretch has still to be built to carry out the terms of the contract; running towards the southern

part of the State, it is extremely important, since it can be considered the beginning of the much-desired and needed railway to the City of Mexico, crossing the State of Tabasco through a number of branch roads connecting with other States of the Republic, thus completing the national railroad system. We think there is here a splendid opportunity for railroad builders who could make arrangements with the Federal Government to construct a whole net of railways which, we are certain, would bring the best of financial results. The Lerma line covers only 8 kilometers and runs along the shore westward from the capital of the State, terminating at the summer and bathing resort of Lerma.

Roads.—There is only one macadamized road in the State, leading from Campeche to Merida, Yucatan. Roads not always in the best of condition exist in the southern and western section of the State. Very much, indeed, has to be done in the matter of highways in this State, and any initiative shown in constructing them would be welcome to the State Government.

Mail—Telegraph.—The mail and telegraph service is in the hands of the Federal Government. Stations, Agencies and Subagencies are to be found in all principal towns and villages throughout the State.

In the town of Campeche there is a *wireless station* which maintains communication with the neighboring State of Yucatan. Of importance is also the submarine cable from the port of Campeche to the port of Veracruz.

Telephone.—The State has no regular telephone service; a few lines are operated by private parties.

CHIAPAS

Railroads.—The only railroad which at present operates in the State of Chiapas is that of the Pan-American which, starting from San Jeronimo, runs to Tapachula and Mariscal; it is also known by the name of Picacho-Suchiate line. It is 458 kilometers in length, and has the following depots: San Jeronimo or Picacho, Ixtaltepec, Espinal, Juchitan, Salineros, Union Hidalgo, Riqueza, Cerro Loco, Zopilote, Ostuta, Reforma, San Nicolas, Las Anonas, Chahuities, Guadalupe, San Ramon, Aurora, Jalisco, San Antolin, Tonala, Esmeralda, La Polka, Cabana, Santa Rosa, San Pedro, Los Patos, Mosquito, El Porvinir, San Antonio, Pijijiapa, Coapa, Margarita, Jerico, Novillero, Mapastepec, Sesocapa, Ulapa, Argentina, Dona Maria, Esquintal, Zacualpa, Pueblo Nuevo, La Cuna, Huixtla, Chamulapa, Huehuetan, Cuapantes, Papayal, Santa Isabel, Tapachula, Los Toros, La Reforma, Cahuacan, El Dorado, Suchiate. This railroad runs from West to East. At Suchiate the line crosses the river, entering Guatemala. There are two small branch lines, from Tonala to Puerto Arista, and another from the same town to the port of Puerto de San Benito. As in most parts of the country the locomotives use crude petroleum, called in the country "chapapote," as fuel.

New lines should be constructed in those parts where the soil is firm, such as at Soconusco, skirting the mountain of this same name; others should be constructed in the southeastern section, so as to place the towns of the coast in communication with those of the interior of the State; and, finally, roads are needed to the Capital, to San Cristobal, to Chiapa de Corzo, etc. When the State of Chiapas

has proper means of communication and business men with sufficient capital, workers will go there from all parts of the country and from abroad.

Roads.—A commencement is just being made to put roads into condition for automobile traffic, although the larger number of sugar and coffee-growing estates already use tractors for their transportation service. There is a causeway from Tapachula to San Jose de Guatemala, and in some parts of the State there are good roads of a similar nature. It is necessary to increase them to a very large extent either by private enterprise, in the interest of private parties, or with the aid of the Government for the common good.

Mail—Telegraph—Telephone.—All these public services are very much behind the times. Only the principal towns are served by the national telegraph line, and along the railroad there are the lines of the railroad company, which only in exceptional cases are at the service of the public.

There are no telephones in the State.

The mail service encounters great difficulties and it usually takes days for letters to reach their destination.

CHIHUAHUA

Railways.—The principal railroad line at present is the railway from Mexico City to El Paso or Ciudad Juarez. Within this State the line covers 676 kilometers, having depots at Escalon, Asunsolo, Rellano, Corralitos, Dolores Jiménez, La Reforma, Diaz, Bustamante, Santa Rosalia, La Cruz, Concho, Saucillo, Armendariz, Las Delicias, Ortiz, Consuelo, Bachimba, Horcasitas, Mapula, Alberto, Morse, Tabaloapa, Chihuahua, Culty, Corral, Molinar,

Terrazas, Sauz, Pinale, Encinillas, Agua, Nueva, Laguna, Arados, Mocho, Loaeza, Gallego, El Sueco, Alsacia, Chivatito, Centauro, Moctezuma, Las Minas, Ojo Caliente, Carrizal, Ahumada, San Jose, Lucero, Rancheria, Carbonero, Candelaria, Los Medanos, Samalayuca, Tierra Blanca, Mesa, Ciudad Juarez. The railway from Jimenez to Rosario which will connect with the Durango line, already finished up to a point beyond Tepehuanes, has within the State of Chihuahua the following stations: Jimenez, Orion, Troya, Baca, Dorado, Morita, Adela, Gomera, Maturana, Parral, Zenzontle, Adrian, Borjas, Peinado, Guevas, Stalforth, Paloma and Rosario, extending over 155 kilometers in a direction from Northeast to Southwest; it has a branch line running from Adrian to Santa Barbara and extending over a distance of 8 kilometers.

One hundred and forty kilometers of the Kansas City, Mexico and Orient Railroad are within this State and cover Tabalcapa, Cruceros, Bella Vista, Muller, Los Leones, Calera, Aldama, Las Trancas, Overton, Gomez, Hormigas, Encantada, San Sostenes, Picachos, Falomir, Marquez.

The Sierra Division has depots at Minaca, Gonzalez, San Francisco, Terrero, Vergel, Sigoina, Pichachic, Ataros, Trevino, Tinaja, Talayotes, San Juanito, Cuesta Prieta, La Laja, Bocoyna, Aguatos, Creel, and Sanchez, extending over a distance of 120 kilometers. Several new roads are being constructed, as for example the Escalon-Sierra Mojada line and others.

There is another railroad line between Ciudad Juarez and Casas Grandes and plans are being worked out to connect all the railroad lines of the State. The line which has to unite Ojinaga with the

port of Topolobampo in the State of Sonora is in the process of construction.

Roads.—The State has also good highways, due especially to the fact that the lands are flat. Some of these roads are largely used for automobile traffic.

Mail—Telegraph—Telephone.—The mail service is efficient only in the places located along the railroad lines; but in the case of other localities such as those situated in the heart of the Tarahumara section, it takes days and days for the mail to reach there.

A considerable number of places in the State have telegraph service, but on the other hand it is still lacking in other places such as the villages situated in the Sierra Madre, where it is very much needed.

Telephone service is maintained only in the towns of Chihuahua, Parral and Juarez.

COAHUILA

Railroads.—This State ranks first among all the States of the Republic in the matter of railroad lines, having about 2,900 kilometers of them. The principal lines run from East to West in an almost parallel direction; in the southern section of the State there is the Coahuila-Pacific line to Torreon; then across a plain, extending northward and sloping from East to West, there is the International Line from Piedras Negras to Torreon, starting from the station of Reata; then there is the practically completed line between Cuatro Cienegas and Sierra Mojada, also running in a direction from East to West. Between all these lines there are many branch lines connecting with important farms or

mines and which gradually will cover the whole State. There is, furthermore, the line from Coahuila to Zacatecas which already runs as far as Concepcion del Oro, touching at several points of the latter State, which for the time being reaps most of the benefits of this new line.

The following is a detailed statement concerning the railroad lines in the State of Coahuila: the railroad from Laredo to Mexico, extends over sixty kilometers and touches at the stations of Gomez Farias, Encantada, Saltillo, Ramos Arizpe, Santa Maria, Rinconada; it runs from South to North. The Ferrocarril Central (Central R. R.) runs from South to North, 100 kilometers of it belonging to this State; its stations are: Jimulco, Picardias, Nazareno and Torreon. The line from Torreon to Piedras Negras has an extension of 303 kilometers in the direction of Monterrey, with stations at Torreon (Jameson and others in the State of Durango), Santo Nino, Santa Teresa, Concordia, San Pedro, Minerva, Talia, Pomona, Tizoc, Hipolito, Saucedo and Paredon. The branch line from San Pedro to Hornos has depots at Santa Elena, San Marcos and Hornos. From Empalme to Piedras Negras 383 kilometers of the line are within the State of Coahuila, with depots at Saucedo, Tortuga, Trevino, Reata, La Perla, Espinazo, Joya, Bajan, Gloria, Castano, Fierro, Monclava, Estancia, Adjuntas, Tapado, Hermanos, Lampacitos, Aura, Barroteran, Sabinas, Blanco, Silencio, Allenda, Nava, Rio Escondido and Piedras Negras. The branch line from Monclava to Cuatro Cienegas is 69 kilometers long; its stations are: Monclava, Pezuelos, Nadadores, Laja, Cuatro Cienegas. A line from Cuatro Cienegas to Sierra Mojada is now under construction. The

branch line from Barroteran to Muzquiz extends over 14 kilometers with stations at Las Esperanzas, Menor, Palau, Muzquiz. The branch line from Sabinas to Rosita covers 19 kilometers; it has stations at Agujita, Cloete and Rosita. The branch line from Saltillo to Reata extends over 101 kilometers and has depots at Saltillo, Ramos Arizpe, Paredon, Anheló, Reata. The Torreon-Tlahualilo line covers within the State of Coahuila 52 kilometers. The Coahuila-Pacific Railroad extends over 301 kilometers, having depots at Encantada, Derramadero, General Cepeda, Parras, Viesca, Hornos, Gilita and Torreon. Of the line from Saltillo to Concepcion, which is intended to go as far as Zacatecas, more than 60 kilometers have been already built.

The following new lines are being constructed: the above-mentioned Saltillo-Zacatecas line, the Cuatro Ciénegas-Sierra Mojada line, the Sierra Mojada-Chihuahua line and the Saltillo-Arteaga line, all of them of great importance to the State.

Roads.—The highways of the State, although not exactly built for that purpose, are being utilized for automobile traffic.

Mail—Telegraph—Telephone.—Due to the abundance of means of communication the postal service in this State is one of the best in the Republic.

There is good federal telegraph service in the principal towns and haciendas or large landed estates, and in exceptional cases, the lines of the railroads are made use of.

Telephone companies are operating at Saltillo, Monclava, Allende, Piedras Negras, San Pedro de las Colonias, Muzquiz, Parras and Torreon.

COLIMA

Railroads.—This State has only one railroad line: the Guadalajara-Manzanillo R. R., serving the territory of this State a short distance beyond Queseria, and covering the following points within the Colima State: Queseria, Fernandez, Alzada, Huerta, Salvador, Estancia, Colima, Balcon, Coquimatlan, Jala, Madrid, Caleras, Tecoman, La Bacula, Periquillo, Armeria, Cuyutlan, Campos, Manzanillo. The above railroad extends over 125 kilometers within the State of Colima. Best results could be expected from new lines or branch lines to different parts of the State, helping to provide an outlet for the natural products. Furthermore, a line connecting this State with towns of the State of Michoacan would be very useful.

Roads.—One highway crosses the State of Colima, coming from Guadalajara and extending as far as Manzanillo. New automobile roads between Colima and the principal towns of the State would be very useful.

Mail—Telegraph—Telephone.—Mail service is regular along the railroad line; in the rest of the State it is reliable but slow.

The Federal Telegraph has offices in Colima, Manzanillo, Comala, Mamey, Tepames, and Villa Alvarez. At Manzanillo there is also a wireless station. There is no telephone service in the State.

DISTRITO FEDERAL

Railways.—The City of Mexico is the meeting point of a number of railroads: Of the Mexico-Laredo line less than 14 kilometers are within the

District as are also 17 kilometers of the Mexico-Acambaro line; then there is the Mexico-El Paso line; the Mexico-Pachuca line; this line is used also by the so-called milk trains which come in twice a day; there is, furthermore, the Mexico-Irapuato-Guadalajara line; the Mexico-Balsas line, which extends over a distance of 47 kilometers within the District; the Mexico-Beristain line, with some 25 kilometers within the boundaries of the Federal District; the Mexico-Veracruz line, the Mexico-Ozumba-Veracruz line and the Mexico-San Rafael-Xico line.

The Federal District has a splendid net of electric railways, running within the City and connecting this with the principal towns and villages of the District. At present there are electric lines between Mexico and Xochimilco with a branch to Tulyehualco, from Mexico to Tlalpam, to Coyoacan, San Angel, Mixcoac, Tacubaya, Tizapan, Ixtapalapa, La Venta (Desierto de los Leones), Tacuba, Atzacapozalco, Panteon Espanol (Spanish Cemetery) Guadalupe Hidalgo. The Mexico-Xochimilco train stops at the following stations: Hospicio, Nativitas, Zacahuizco, Ladrillera, Portales, Country Club, Taxquena, Xotepingo, San Antonio Coapa, Hacienda de Coapa, Santa Ursula, Huipulco, and Tepepam; it has an extension of 24 kilometers. From Xochimilco the trains run southward as far as Tulyehualco, stopping at San Pedro, Nativitas, Espinazo, Santa Cruz, San Gregorio, San Luis, and Tulyehualco; from Huipulco a train goes westward touching at Tlalpam. The City itself is crossed by a large number of lines.

Roads.—There are a number of fine roads for the traffic of automobiles, such as the Mexico-Tacuba-Atzacapozalco road, the Mexico-Churubusco-Tlalpam

road and a highway to Coyoacan and San Angel, the Mexico-San Angel road passing through Mixcoac, the Mexico-Tacabaya-San Angel road passing through Mixcoac, the Mexico-Tacubaya-San Angel road, the road from Mexico to the Desierto de los Leones (the lion's desert), the Mexico-Guadalupe-Hidalgo road, the Mexico-Guernavaca road, the Mexico-Queretaro road, the Mexico-Puebla road. All these roads are frequented by a large number of automobiles and motor trucks; especially beautiful is the Tacuba-Chapultepec avenue.

Mail—Telegraph—Telephone.—The City of Mexico is the center of the mail and telegraph systems of the Republic.

The General Direction of Telegraphs is situated in the beautiful Palace of Communications; from this wires run to all parts of the country; the service is very well attended to. The cable company has its own telegraph wires.

The City is served by two large telephone companies with tens of thousands of subscribers within and without the City.

In the vicinity of the Chapultepec Castle there are a number of wireless telegraph towers, constituting an extremely powerful receiving and sending station.

The postal service is very good. The central offices are located in a special building, one of the finest of its kind in the world; there are also a number of post offices distributed all over the city.

DURANGO

Railways.—The Ferrocarril Internacional owns the main line from Durango to Torreon and to

Piedras Negras, and various branch lines from Canitas to Tepehuanes and to Llano Grande. The Central Railroad also has some branches which, like the former, are described below.

The Central Railroad runs from South to North, crossing San Juan de Guadalupe and Mapimi. Its principal depot is Gomez Palacio. A junction is effected with it by the branch lines from Conejos to Descubridora (135 kilometers) and from Bermejillo to Mapimi (42 kilometers), which run from East to West, and from West to East respectively; also from Bermejillo to Dinamita (20 kilometers), which run from East to West. The principal depots on the Central are: Gomez Palacio, Bermejillo, Jaral, Conejos, Yermo, and Cevallos, in Mapimi, and Timon, in San Juan de Guadalupe. The International Railroad is 249 kilometers long with depots in Aviles, La Goma, La Loma, Trinidad, Pedricena, Pasaje, Yerbaniz, Noria, Catalina, Tapon, Gabriel, Chorro, Labor, and Durango, which is the terminal station; it has the Canitas branch line with 100 kilometers of track in the State and the following stations: Tuitan, Pajaritos (Poanas), Muleros and Suchil. The branch of Tepehuanes which joins the line coming through Parral, is 211 kilometers long and runs from Southeast to Northwest, with stations at Carpintero, Cacaria, Canatlan, Guatinape, Chinacates, Santiago Papasquiaro and Tepehuanes; a branch line to Llano Grande, on the Mazatlan road, is in the process of construction already advanced beyond Llano Grande, a distance of about 150 kilometers. Thirty kilometers of track railroad of a line running from Parral with a depot at Rosario, now called Villa Ocampo, are within this State. The railroad which runs from Gomez Palacio to

Zaragoza (formerly Tlahualilo), a branch of the Central line, has 96 kilometers of track. The railroad to Mazatlan (reaching beyond Llano Grande) and that of Parral (up to a point beyond Tepehuanes on the south and Rosario in the north are under construction. Plans for a lumber-hauling track from Suchil to Michis and an ore-carrying railway from Suchil to Noria de San Pantaleon, in the State of Zacatecas, are now being worked out.

Lines are especially needed in the Sierra Madre section and on the steppes of Cuencame and Inde. What is greatly needed in these sections is to put some of the highways into such condition as to allow of automobile traffic, which would provide a means of easy and rapid means of communications. Automobile roads can be constructed between Durango, Canatlan and San Juan del Rio, Durango and Nazas, Tapona and Juan Perez.

Mail—Telegraph—Telephone.—In the city of Durango there are telephone lines serving the town, and lines which link up Durango with practically all the nearby haciendas, such as Navacoyan, Labor de Guadalupe, Alcalde, Ferreria, El Chorro, San Salvador, and others on the banks of the Tunal and in the Valley of Guadiana. There are also lines to Gabriel and to Tapona, and from there to Juan Perez and other places. There are telegraph offices in all the principal towns of the State (Durango, Gomez Palacio, Lerdo, Mapimi, Cuencame, San Juan de Guadalupe, Nombre de Dios, San Juan del Rio, Nazas, El Oro, Inde, Santiago Papasquiaro, Topia, San Dimas, Pueblo Nuevo, Muleros, Suchil and Mezquital). Along the railway lines there are telegraph stations at all the depots, although these can be used by the public in exceptional cases only.

A wireless station is being constructed and will probably be finished by the time of the publication of this book, in the city of Durango, on the small eminence called the Hill of Calvary.

The *Mail Service* is excellent in those places which are located on or near the railways. There are some towns where letters are delivered by rural mail carriers (such as Pueblo Nuevo, San Dimas, Topia, Tanazula and others), after eight days of travel.

GUANAJUATO

Railways.—This State is served by some railroad lines, although there are still considerable areas in several sections of the State which enjoy no such advantage. The principal lines, part of which are within the State of Guanajuato, are the following: the Mexico-Laredo line, which touches at the stations of Mariscal, Cosio, Jocoque, Manuel, Empalme de Gonzalez, Comonfort, Rinconcillo, El Tunel, Bogona, San Miguel de Allende, Taboada, Atotonilco, La Petaca, Tequisquiapam, Dolores Hidalgo, Rincon, Pena Prieta, Trancas, Obregon, San Felipe, Chirimoya, Cartagena, Jaral de Berrio, having an extension of 187 kilometers. Of the Mexico-Acambaro line covering a distance of 59 kilometers in this State it has the depots of Tarandacuao, San Jose, Providencia, Banos Calientes, Acambaro, Costura, Alvarez and Andocutin. The railroad from Jaral del Valle to Salamanca and Guanajuato has an extension of 55 kilometers in its section from Irapuato to Jaral, with depots at Irapuato, Chico, Salamanca, Los Lobos, Garma, Valle de Santiago, Covadonga, Grande, La Bolsa, Jaral del Valle. The branch line from Irapuato covers a distance of 54

kilometers with depots at Irapuato, Vieyra, Villalobos, Silao, Marfil, Guanajuato. The branch line from Irapuato to Empalme de Gonzales has a length of 71 kilometers and stations at Irapuato, Chico, Salamanca, Cerro Gordo, Santa Cruz, Marquez, San Elias, San Juan de la Vega and Gonzalez. The branch line from Acambaro to Empalme Gonzalez is 86 kilometers long and has depots at Acambaro, Silva, Betti, Manzana, San Cristobal, San Augustin, Guzman, Salvatierra, Corral, Banales, Cascalote, Ojo Seco, Ramayo, Celaya, Santa Rita, Mendoza, San Juan de la Vega, Soria, Gonzalez. The branch from Rincon to Villa de Pozos extends over a length of 60 kilometers, having depots at Rincon, Montelongo, Lourdes, San Luis de la Paz, Pozos. Of the Mexico-El Paso line 162 kilometers of track are laid within this State and connect the following stations: Mariscal, Apasco, Celaya, Crespo, Guaje, Sarabia, Salamanca, Chico, Irapuato, Vieyra, Villalobos, Silao, Napoles, Trinidad, Leon and Francisco. A little over 72 kilometers of track of the Mexico-Guadalajara line belong to this State with stations at several points which at the same time form part of the Mexico-Laredo line as far as Irapuato; from there on it has stations at Charcos, Covarrubis, Rivera, Joaquin, Abasolo, Corralejo, Penjamo, Villaseñor, Palo Verde, and Cortes; the 72 kilometers given above must be counted from the station of Irapuato. Of the branch line from Penjamo to Ajuno the State of Guanajuato has depots at Penjamo, Barajas, La Cal'e and Tres Mezquites. Of the Acambaro-Queretaro line 44 kilometers are within this State, with depots at Guadalupe, Jaral, Santa Rosa, Agustinos, Salitrera, Ojo de Agua and Jerecuaro. This last line is still under

construction, for its terminal will be the city of Queretaro.

A profitable undertaking would be the construction of the following new railroad lines: Guanajuato-Gonzalez (60 kilometers), Guanajuato-San Miguel Allende (50 kilometers), Gonzalez-San Diego de la Union (40 kilometers), Gonzalez-Ocampo (30 kilometers). At least the highways between places just named should be put in a proper condition for the automobile and motor truck traffic, which would greatly increase the prosperity of the above-named section.

Mail—Telegraph—Telephone.—The postal service is quite efficient, even in places not located on the railroad lines, for in most cases they are not far away from these lines.

The majority of the towns, villages and settlements have telegraph offices in this State; telephone service is also quite extended in the State, the present tendency being to add more and more miles of telephonic wires all over the State.

GUERRERO

Railways.—This State has no railroad except a portion of the Mexico-Balsas line for a distance of 103 kilometers, with depots at the following places: Cajones, Santa Fe, Vista, Pimentel, Los Amates, Naranjo, Coculo, Apipilulco, Oleo, Arroz, Balsas.

The geographic features of this State made the construction of railroads very difficult and expensive, but, on the other hand the natural wealth of this State is so great that the building of railways, indispensable for the systematic development of this part

of Mexico, will eventually prove a perfectly paying proposition.

Roads.—There are a few highways in the State, as for example the one leading from Chilpancingo to Iguala which is utilized for automobile and motor-truck traffic, and another road from Chilpancingo to Acapulco.

Mail—Telegraph—Telephone.—The postal service is deficient in this section of the Republic, with the exception, of course, of those places which are located along the railroad line and such localities as are not far away from it. Nor is telegraphic service satisfactory. There are telegraph offices at Chilpancingo, Iguala, Acapulco, Huamuxtitlan and in a few other places.

The telephone is just beginning to be utilized in some places of the State.

HIDALGO

Railways.—First among the railways of this State is the Mexico-Pachuca line. This leaves the City of Mexico and enters the State of Hidalgo at Teocalco; it has depots at Jaltocan, Temascalapa, Terreros, Tellez, Pitahaya, Hoyos and Pachuca; about 60 kilometers of this line are within the limits of this State. The track from Tula to Pachuca is 71 kilometers in length, and passes through Tula, Iturbide, Teocalco, Tlaxecapan, Tetepango, Valentin, El Gorrion, Rosal, Temoyaya, Tecamatl, Concepcion and Pachuca. The line from Tellez to Honey is 95 kilometers long and has depots at Tellez, Sandoval, Metepec, Zontecomat, Somorriel, Cuyamaloya, Paxtepec, Tepenacasco, Tulancillo, Anita, Panfilo, Canales, and Honey. The track from Berestain (State

of Puebla) traverses the State of Hidalgo and passes these points: Tezontepec, Relinas, San Augustin, Tepa, Pueblillo, Tecajete, Somorriuel, San Joaquin, Las Lajas, Los Romeros, Otlimulco and Ventoquipa. From Ventoquipa to Apulco there is a line which extends over 35 kilometers, with depots at Ventoquipa, Santiago, Tulancillo, Sostlan, Tortugas and Apulco.

There is a project to connect Berestain with Tampico and make the line pass through a very rich section of the State of Hidalgo. The Huasteca sections at present are short of railway lines and need them in order to transport rapidly their products and increase industrial activity, which at present does not yield the return it should.

Roads.—There are no good roads for auto trucks; these could be built not only in the Apam plains, where they would be of great service in transporting local products to the railway lines, but they might also be run between Tula and Tulancillo and other towns.

Mail—Telegraph—Telephone.—The post offices give good service in this State, with the exception of those places which are located in the heart of the Huasteca section, such as Huejutla and others, to which it takes three or four days for correspondence to arrive.

Pachuca, Tulancillo, Real del Monte, Tula, Huejutla, Zacualtipan, Apam, Tenango and other towns have telegraph lines which are part of the Federal System. In the City of Pachuca, Tula, Tulancillo, Real del Monte, Zimapam, Zacualtipan and various haciendas there are telephone lines which are connected with the telephone systems of the City of Mexico. There is another telephone company in the City of Pachuca.

JALISCO

Railroads.—Taking into consideration the needs of this State, its railway facilities are inadequate. First of all we shall mention the Mexico-Guadalajara, via Irapuato, line with stations at Salamea, La Barca, Feliciano, Limon, Ocotlan, Poncitlan, Constanca, San Jacinto, Corona, Atenquiza, La Capilla, El Castillo, Kings, La Junta, Guadalajara; this line extends over 110 kilometers. The Guadalajara-Manzanillo line, extending over a distance of 218 kilometers within the State of Jalisco, has stations at Guadalajara, La Junta, El Cuatro, Orozco, Tlajomulco, Flores, Tepetates, Mazatepec, Valencia, Balastre, Santa Ana, Catarina, Zacoalco, Verdia, Techalota, Cofradia, Carmelita, Sayula, Quemada, Nicolas, Manzano, Providencial, Ciudad Guzman, Huescalapa, Zapotitlic, Tuxpan, Quito, Platanar, Higueras, Villegas, Tonilite. The branch line from Ocotlan to Atotonilco is 35 kilometers long and has depots at Ocotlan, Zula, Alcalde, Navarro, and Atotonilco. The branch line from Guadalajara to Ameca has a length of 90 kilometers, with depots at Guadalajara, Jocotan, La Venta, Primavera, Orendain, Refugio, Cuicillos, Pacaha; the branch from La Vega to San Marcos extends over 46 kilometers and has stations at La Vega, Carmen, Ahuahualulco, Estanesta, Etzatlan, Barcenas, San Marcos. The branch line from Guadalajara to La Capilla has a length of 33 kilometers.

The great project to connect the center of the country with the States situated on the Pacific coast by railway will have its starting point at the City of Guadalajara. The construction of this system is already well under way, but the greatest difficulties

from the engineering standpoint still remain to be overcome, viz., the crossing of the Sierra Madre.

Another railroad line in this State is the one running to Juanacatlan with stations at El Salto, Estacion, El Castillo, Guadalajara.

The State has a branch line on the Mexican Southern Pacific Railroad from Guadalajara to Orendain, touching at Magdalena, Cuervo, Tequila, Amatitlan, Quiteria and Arenal, extending over 60 kilometers.

A new railroad is planned between the City of Guadalajara and the small port of Chamela on the Pacific, but construction work has not yet started.

There are still regions in the State which have no ready means of communication, as, for instance, the southwestern and northern sections. The eastern part of the State is crossed at several points by the Mexico-El Paso Railroad, covering about 100 kilometers, the stations being Pedrito, Loma, Lagos, Mira, Los Salas, Castro, Doble, Santa Maria, Encarnacion de Diaz and Tigre.

Roads.—Automobile roads should be constructed from Sayula to Tamazula (40 kilometers), from Sayula to Atoyac (15 kilometers), from Sayula to San Gabriel (25 kilometers), from San Gabriel to Autlan (100 kilometers), from Ameca to San Martin (15 kilometers), from San Martin to Cocula (15 kilometers), from Ameca to Mascota (110 kilometers), from Mascota to Talpa (28 kilometers), from Ahualulco to Tequila (20 kilometers), from Guadalajara to Yahualica (112 kilometers), from Encarnacion to Teocoltiche (35 kilometers), from this place to Mexitacan (20 kilometers), from Lagos to San Juan (40 kilometers), from this place to Jalostitlan (12 kilometers), from

here to San Miguel El Alto (12 kilometers), from Atotonilco to Arandas (28 kilometers), from Atotonilco to Tepatitlan (32 kilometers), from Guadalupe to Magdalena (160 kilometers), from Magdalena to Bolanos (40 kilometers), from Bolanos to Totache (30 kilometers), from here to Colotlan (25 kilometers), from Colotlan to Mezquic (25 kilometers), and from this last place to Huejuquilla (24 kilometers). These last places are nearer to the railroads of the State of Zacatecas, being 140 kilometers away from the nearest station which is Fresnillo.

All these regions are very rich and roads we have just mentioned are necessary to facilitate the export of the local products.

Mail—Telegraph—Telephone.—The mail service is very satisfactory in this State, with the exception of the places in the northern section. Most of the places we have mentioned above are served by the Federal Telegraph System and by the lines of the railroads. A fairly good telephone net is being gradually established in the larger towns of the State, in fact, all over the State.

MEXICO

Railways.—In spite of the fact that the State of Mexico to a great extent encloses the Federal District, thus profiting more or less by all the railway lines which start from the City of Mexico in every direction, roads are still wanting in the southern part and in the Valley of Toluca.

As to the roads which touch parts of this State we have: the Mexico-Toluca line which extends over 164 kilometers and has the following depots: Laurel,

San Martin, La Cima, Salazar, Carretera, Fresno, Jalapa, Maclovio, Herrera, Lerma, Dona Rosa, Toluca, Palmillas, Presa, Mina Mexico, Del Rio, Ixtlahuaca, Tepetitlan, Solis, Tepetongo, Agua Buena and Colorado. The Mexico-Laredo and the Mexico-El Paso lines have 35 kilometers within this State and the following stations: Tlalnepantla, Barrientos, Lecheria, Cuautitlan, Teloyucan and Huehuetoca. The line to Xico lies for some distance in the State of Mexico. The Veracruz Railroad runs for 60 kilometers within the State of Mexico, touching at the stations of San Vicente, Gonzalez, Chapingo, Texcoco, San Andres, Escudero, Robles, Antonio, San Juan de Teotihuacan, Metepec, Otumba, Victor, Aguatepec and Campero.

The State is also crossed, although for a short distance only by the railway from Mexico City to Cuautla with stops at Cima, Toro and Tres Marias.

Roads.—A road for automobile traffic, although not in a very good condition, exists between the City of Mexico and the City of Toluca, and there are similar roads between the City of Toluca and several large ranches in the neighborhood. On the whole, all the roads extending from the City of Mexico towards the north of the Republic are utilized for automobile traffic. Very likely the public highways in general will be greatly improved in order to make them available for this modern system of communication.

Mail—Telegraph—Telephone.—The postal service is very regular, the towns and settlements receiving their mail with the desired promptness, with the exception of the southern region, where the delivery of mail is very much delayed.

Every important town in the State of Mexico

has its telegraph office, and is fairly well served by local telephone lines as well as by the two companies established in the City of Mexico.

MICHOACAN

Railroads.—As has already been stated repeatedly the State of Michoacan feels the need of rapid communication. The lines which at present are used in exporting its wealth are relatively few compared with what are needed in so rich a region. Eighty-six kilometers of the railway from Mexico to Acambaro are within this State, with railway depots at Mayor, Madera, Pateo, Pomoca, Marravatio, San Antonio, Ziritzicuaro, Tarandacuac, San Jose, Providencia, Banos Calientes, and Acambaro. Up to Maravatio this railway line runs in a northerly direction, and from this point it bends round to the southwest and extends as far as Acambaro.

The trains on this line go from Acambaro to Uruapan in a southwestern direction, following a somewhat zigzag course; there are the following stations: Costura, Alvarez, Andocutin, Huingo, Coro, Querendaro, Zinzimeo, Quirio, Charo, La Goleta, Atapaneo, Morelia, La Huerta, Monterubio, Jacuaro, Noriega, Coapa, Lagunilla, Fontezuela, Chapultepec, Playa, Pazcuaro, Charuhuen, Bonilla, Ajuno, Lopez, Ajambasan, Jujucato, Tarascon, Puranguitiro, Gonuy, Las Palomas, Aristeo, Santa Catarina and Uruapan. The distance between Acambaro and Uruapan is 224 kilometers. The railroad from Maravatio to Zitacuaro is 90 kilometers long and has the following stations: Maravatio, Chamuco, Canedo, Senguio, Tarinero, Irimbo, Aporo, Alvarado, Arguello, Oyamel, Sanido, La

Junta, Angangueo, Trojes, Ocampo, Hernandez, Tuzpan, Sirehuato, Ocurio, Curungnee and Zitacuaro. The State of Michoacan is served by several stopping points of the Guadalajara line; as La Piedad, Yurecuaro, Penjamo. There is a line from Ajuno to Penjamo 136 kilometers long, which has depots at Penjamo, Barejas, La Calle, Tres Mesquites, Los Angeles, Villachuato, Moluco, Miravalle, Tunillas, Curimeo, Punindicuaro, Carranza, Los Espinos, Tariacuri, Juapa, Zacapu, Ortega, Cortijo, Comanja, Escobillas, Opongio, Erongariacuaro, Ajuno. The railroad from Yurecuaro to Los Reyes is a branch line of 138 kilometers in length and has depots at Yurecuaro, Verduzco, Las Fuentes, Falconi, Torcasas, Lopez, Ingenio, Zamora, Ario, Davalos, Chavinda, Moreno, Balastrera, Guarracha, Angel, Tarecuato, Centeno, Mercado, Tinguidin, Espuela and Los Reyes.

New railroads, serving the Southern Plateau would be of extreme advantage. Some difficulties are offered by the geographic features of the country, but they are not insuperable, and all efforts made in this direction would be most amply rewarded.

Roads.—The need of roads for automobiles is also very great. There is at present the proposal to construct roads of this kind between Uruapan and various places in the south of the State. The construction of these would in a measure compensate for the lack of railways but railroads, of course, would be far better.

Mail—Telegraph—Telephone.—The State is poor in facilities of this kind. The City of Morelia has its own telephone service, and two companies of Mexico City have several telephone stations in Tlalpujahua. There are telegraph offices only in the

large towns, such as Morelia, Uruapan, Maravatio, Zitacuaro, La Piedad, Cabadas, Zamora and in a few other places.

The mail department is still more deficient as regards service, and for letters from the south to reach their destination it takes more than a fortnight.

MORELOS

Railways.—Within the State of Morelos are 120 kilometers of the Mexico-Balsas Railroad; the stations are: Toro, Tres Marias, El Parque, Alarcon, Ramon, Cuernavaca, Mango, San Vicente, Chiconcoac, Tetecalita, Treinta, Juan Pagaza, Hermosa, Vidal, Puente de Ixtla and Amor. Of the railroad from Mexico City to Ozumba, Cuautla and Puente de Ixtle, 118 kilometers of track are within this State, with the stations of Retorta, La Cascada, Cerro, Yocapixtla, Cuautlixco, Santa Ines, Cuautla, Casasano, Calderon, San Carlos, Lister, Oacalco, Yautepec, Atlinuayan, Ticuman, Alejandra, Tomilpa, Tlaltizapan, Tlaquiltenango, Jojutla, Clemente, Jacques, Vallespin, Zacatepec, Obispo, San Jose, Paco and Puente de Ixtla. Of the Puebla-Cuautla line 63 kilometers of track are laid in this State, with stations at Lagunillas, Organo, Muerto, Azochiapan, Garcia, Pastor, Huichilac, Tenoxtepango, Cuahuixtla and Cuautla.

Railway lines are needed in several rich sections of the State; the construction of such lines would be of great benefit to the agricultural industries, and the concern that would engage in the building of these lines would certainly reap a rich financial reward.

Roads.—There is a fairly good road for the

traffic of motor cars between Mexico City and Cuautla, in this State, via Cuernavaca. More highways for this purpose are being constructed at present.

Mail—Telegraph—Telephone.—The mail service in this State is satisfactory, correspondence reaching its destination without any undue loss of time.

So far no telephone service exists in this State.

There are telegraph offices at Cuernavaca, Cuautla, Yautepec, Jojutla, Totocala, and Puente de Ixtla; then there are, of course, the telegraph lines of the railroad, of which use can be made by the public in cases of emergency.

NAYARIT

Only one railroad line crosses the territory of this State, covering a distance of 166 kilometers. The trains stop at the following stations: Acaponeta, Chispa, Tecomate, Motaje, Bonita, Morada, Chilapa, Ruiz, Yago, Nanche, Pani, Jabali, Roseta, Corte, Mango, Aguirre, Mora, Escobar, Tepic. Lines are being constructed between Tepic and the port of San Blas, and between Tepic and Guadalajara.

Roads.—There are already a number of roads in the plains along the Pacific which are used for the traffic of motor vehicles, and more such roads, although not entirely satisfactory, can easily be built in that section. In the sierras, of course, the building of any kind of roads is a far more difficult proposition.

Mail—Telegraph—Telephone.—Only such places as Compostela, Acaponeta, Tepic, located along the railroad line, and San Blas, have efficient mail serv-

ice; the other places receive their mail late and irregularly.

Telegraph offices are established at Tepic, Santiago, Ixcuintla, Compostela, Acaponeta, San Blas.

There are no telephone lines in this State.

NUEVO LEON

Railroads.—The territory of this State is crossed by several important railway lines. There is first of all the Mexico-Laredo line which enters the State at Garcia, touching afterwards the stations of Durazno, Santa Catarina, Aztec, Leona, Piedra, San Geronimo, Gonzalitos, Monterrey, Ramon Trevino, Topo, Leal, Salinas, Morales, Lambdin, Stevenson, Palo Blanco, Alamo, Villaldama, Guadalupe, Bustamante, Palma, Golondrinas, Candela, Brasil, Lampazos, Naranjo, Mojina, Mesa, Rodriguez, Camaleon, Huizachito, Altos, Jarita and covering some 273 kilometers within the State of Nuevo Leon.

The Monterrey-Torreon line has stations at Icamole, Fraile, Pesqueria, Durazno, Mineria, Monterrey, extending over 50 kilometers. The line from Monterrey to Reata has depots at Monterrey, Topo Chico, Topo, Grande, Chipinque, Mina, Hidalgo, Arista, Ixtle extending over 74 kilometers.

The railroad from Monterrey to Matamoros is 166 kilometers in length within the territory of this State, having stations at Monterrey, La Grange, Apodaca, Pesqueria, Milpa, Ayancual, Ramones, Loma Barretosa, Herreras, La Laja, Aldamas, Doctor Cos, Zacate, Ochoa.

Roads.—This State is probably the best equipped in the matter of roads when compared with the other States in the Republic. Of course, more roads

are needed to establish easy and rapid communication with the villages and settlements that are located at some distance from the railway lines.

Mail—Telegraph—Telephone.—All the places of importance have telegraph offices of the Federal Telegraph System. The cities of Monterrey and Linares have an extensive telephone net.

The postal service is one of the best in the Republic.

OAXACA

Railroads.—All the lines in the State of Oaxaca are of relatively recent date and may be considered very insufficient for the great needs of this section.

The principal line is, doubtless, that from Puebla to Oaxaca, which connects the latter city with the Capital of the Republic and with the interior of the country. It has within the State of Oaxaca about 174 kilometers of track, and railway depots at San Antonio, Ignacio Mejia, Tecomavaca, Quitepec, Los Obos, Cuitatlan, San Pedrito, Tomellin, Organal, Almoloya, Venado, Santa Catarina, Anona, Parian, Escondida, Las Sedas, Telixtlahuaca, Huitzo, Suchiquitongo, Magdalena, Etlá, Mogote, Hacienda Blanca and Oaxaca.

The line from Oaxaca to Tlacolula (called by the people of the place "Tlacolula de los libres," in allusion to the Oaxacan spirit of independence) is 33 kilometers in length and has depots at Oaxaca, Oriente, Santa Cruz, Santa Maria del Tule, Guendulain, Abasolo, Guelavia and Tlacolula.

The track from Oaxaca to Taviche is 56 kilometers in length and has depots at Oaxaca, Santa Anita, Xoxo, San Isidro, Jalpan, Zaachila, La Trinidad, La Cienega, Zimatlan, San Nicolas, San Pablo,

Santiago Apostol, Ocotlan, Guebesche, La Cima and Taviche.

The line from Oaxaca to Ejutla has a length of 69 kilometers and has the same depots as the last-mentioned line, as far as Ocotlan; whence it runs to San Dionosio, San Pedro Apostol, Garzona, San Martin, Vergel, Bonequi and Ejutla.

Direct railway communication with Salina Cruz and Puerto Angel would be very advantageous as the merchandise which is unloaded at those ports would reach the market more rapidly by such lines than by the Tehuantepec Railroad.

The Tehuantepec Railroad is also partly within the State of Oaxaca, where it has about 140 kilometers of track, with stations in Palomares, Sarambia, Mogone, Ives, Rincon, Antonio, Lagunas, Almolaya, Chivela, Mena, Rio Verde, San Geronimo, Comitancillo, Jordan, Tehuantepec, Santa Cruz, Pearson, Salina Cruz. This line is very important, as it connects the two coasts, the Pacific and the Atlantic. The total length of the line from Salina Cruz to Puerto Mexico is 304 kilometers, laid on a soil which vibrates with the passage of the train at a good distance from the track.

Railway lines are needed in all sections of this State, but more especially on the Guerrero side and towards the coast.

The difficulties in the way of building more rapid lines of communication in this State are the same as obtain in the States of Michoacan and Guerrero; the extent of mountainous country makes the laying of track very costly. Whatever the expense, however, this would be amply repaid by the benefits it would bring as almost virgin sections of the country would be opened up to production and development.

Roads.—Roads are very few for the same reason, the local roads being more of the nature of bridle paths than real roads. Lately there has been a move in favor of improving the roads to make them suitable for truck and tractor traffic.

Mail—Telegraph—Telephone.—Only the most important towns have telegraph facilities. There are no telephone companies at present. It is only in places which are fairly close to the railway lines that there is a good postal service; the remaining localities have a poor mail service or none at all.

At Salina Cruz there is a wireless station.

PUEBLA

Railroads.—Puebla has numerous railway lines but they do not cross the entire length of the State. Lines are lacking in the southern section, and even in the north there is probably less railroad traffic than could be developed.

The principal lines are: the Mexico-Puebla line, via Texmelucan and Texcoco; the Mexico-Puebla line, via Apizaco; the Puebla-Veracruz line, via Jalapa; the Mexico-Veracruz line; the Puebla-Oaxaca line with branch lines to Esperanza and Acatlan; the Puebla-Chiautla line; the Mexico-Beristain line. Of the Beristain line 30 kilometers of track are within this State, with stations at Egula, Sueyapam, Cima de Tongo, Aserradero, Ahuazontepec and Beristain. On the direct road from Mexico City to Veracruz the State of Puebla has some 20 kilometers of track with stations at Oriental, Virreyes, Varela, Tepeyahualco; of the Puebla-Jalapa (Veracruz) line 144 kilometers are laid in the State of Puebla with the following railway depots: Gillow, San Martin, San

Lucas, Bartolo, La Posta, Analco, Xoxtla, Coronango, Los Arcos, Beneficencia, Union, Dobladero, Puebla, San Cristobal, Signoret, Amozco, Malintzin, Acajete, Temaxcalito, Aldavo, La Venta, San Marcos, Chiapa, Santa Ana, Sesma, Manantiales, Vicencio, Carmen, Oriental, Virreyes, Varela and Tepeyahualco. On the Puebla-Cuautla line, covering a little more than 110 kilometers within the State, the State has the stations of Puebla, Dobladero, Union, Los Arcos, Eiva, Carcana, Cholula, Nixcoatl, Santa Maria, Tecuanipan, Frailes, Molinos, Portezuelos, Atlixco, Savana, Champusco, Teruel, Tepejojuma, Balastrera, Tatetla, Matamoros, Mier, Colon, Chietla, Atencingo, Ahuehuetzingo. The Atencingo-Tlancualpican line is 20 kilometers long and has depots at Atencingo, Jaltepec, Espelon, and Tlancualpican. On the Oriental-Teziutlan line there are the following stations: Oriental, Virreyes, Noria, Libres, Concepcion, Pochintoc, Martel La Rosa, Huitzitzilapan, Oton, Acuario, Calera, Zaragoza, Cervantes, Gomez, Tezompan, Sosa, San Isidro and Teziutlan. From Libres a branch line runs to Virreyes, with stations at Lugarda, Teoloyucan, Las Vigas, Virreyes. On the Puebla-Oaxaca line which has a length of more than 130 kilometers, there are railway depots at Chachapa, Amozoc, Trigal, Tres Jagueyes, Santa Rosa, Tepeaca, Rosendo Marquez, Asuncion, Tecamachalco, Las Animas, Tlacotepec, Tepanco, Carnero, Tehuacan. The Esperanza-Tehuacan line serves El Salado, San Antonio de la Soledad, Canada, La Defensa, Llano Grande, Cabras, El Carmen, Miahuatlan and Tehuacan.

A railroad is at present being built from Beristain to Tampico, running in a northerly direction.

There are sections in this State, as for example the Sierra of Zacapoaxtla and some in the south, where railroad lines are badly needed, in order to take full advantage of the many natural resources which abound in those regions.

Roads.—An automobile road leads from Mexico City to the City of Puebla and a number of other similar roads are under construction.

Mail—Telegraph—Telephone.—Puebla has a good telephone system of its own and is also served by the telephone companies of the City of Mexico.

Every town and village of importance has a telegraph office.

The mail service is good with the exception of the places located far away from the southern railroad line, and the mail of Zacapoaxtla.

QUERETARO

Railroads.—The principal railroad lines which, starting from Mexico City run towards the North, pass through territory of this State, traversing it in the direction of its largest extension; the same is true of the Mexico-Guadalajara line, the two providing the State with excellent rapid transit facilities. The Mexico-Laredo line covers 74 kilometers within this State and has stations at Bernal, San Nicolas, La Llave, Noria, Bivorillas, La Griega, Hercules, Queretaro, Las Adjuntas. The Mexico-El Paso line has in this State 105 kilometers of track and the following stations: Cazadero, Palmillas, Peon, San Juan del Rio, Santa Elena, Chintepec, Ahorcado, La Griega, Hercules, Queretaro, Las Adjuntas. On the Mexico-Irapuato line the State has the same stations which we have mentioned in describing the Mexico-El Paso line.

A new line is being built to connect Queretaro with Acambaro, the tracks being already laid to a point beyond Jerecuaro in the State of Guanajuato.

Roads.—The largest extension of this State is crossed by railway lines but there are a few regions, such as those of Cadereyta, Jalpan, Toliman, which, being situated at a considerable distance from the railroads, must make use of the highways; these highways are to some extent being utilized for the traffic of motor vehicles and can be easily improved for this kind of communication.

Mail—Telegraph—Telephone.—The National Telegraph System has offices in Queretaro, Cadereyta, San Juan del Rio, Jalpan, Toliman, Tequisquiapan and in other places.

The telephone system is being developed at the present time and promises to become quite efficient.

The postal service in the State is fairly good.

QUINTANA ROO

Railroads.—This Territory, notwithstanding its enormous extent, has not a single railroad to facilitate the exploitation of its rich soil. The Federal Government is considering a plan to build a railroad which would start from Payo Obispo, the capital of the Territory, touch at the villages of Bacalar and Mandinga, and at Peto make junction with the Southern Division of the Yucatan Railroad System. This line would be 270 kilometers in length. Another line is planned which would start at the village of Bacalar, run into the Territory of the State of Campeche and cover a distance of 107 kilometers within the limits of Quintana Roo.

These two projects originated long ago, but for

some reason or other no work has been started on either one. We think there is here a good opportunity for men of initiative, in view of the fact that the Federal Government would grant the most favorable terms for the building of the two railroads.

Roads.—There was at one time a cart road, now completely abandoned, starting from Peto, State of Yucatan, and covering something like 270 kilometers of Quintana Roo Territory. The building of an automobile road is under consideration; this road will have a length of 135 kilometers.

Mail—Telegraph—Telephone.—The mail service is very restricted in Quintana Roo, due to the absence of important settlements, the great distances and the lack of roads. There are post offices at Payo Obispo, Puerto Morelos, Holbox and in Cozumel, capital of the island of that name. Two small Government boats maintain a regular mail service between the Yucatan port of Progreso, Cozumel and Payo Obispo. In the latter place mail is also received from Belize (British Honduras) and Guatemala (Central America).

There is a telegraph office at Puerto Morelos having connection with the town of Valladolid in the State of Yucatan.

Wireless stations are established at Payo Obispo and Xcalak.

There is no telephone service in any place in the Territory.

SAN LUIS POTOSI

The State of San Luis Potosi has two lines of railway of considerable length: the National Railroad, with about 316 kilometers of track, having

the following stations: Villa de Reyes, Jesus Maria, La Pila, Arroyos, San Luis Potosi, Bocas, Moctezuma, Venado, Charcas and Vanegas. The track from Aguascalientes to Tampico has a length of not less than 550 kilometers; on this line are the following stations: Salinas, Justino, San Luis Potosi, Peotillos, Cerritos, San Bartolo, Las Tablas, Cardenas, Las Canoas, Tamasopo, Valles, Las Palmas, Ebano. There are two important branch lines: that of Vanegas to Matehuala, 47 kilometers in length. This is essentially an ore-hauling line; it starts from Vanegas, passes through Cedral and has, in addition to what we have just mentioned, a length of about 30 kilometers, passing through the rich mineral district of Santa Maria de la Paz. The branch from San Bartolo to Rio Verde is 42 kilometers in length. Besides these lines there is the Potosi-Rio Verde line 51 kilometers in length, a road carrying chiefly ore and timber, and touching at Cerro de San Pedro, where the richest mines of the State are worked. The Coahuila and Zacatecas railway crosses a portion of the northern part of the State.

New railway lines in the Huasteca section of the State are very much needed to make possible a better utilization of the product of this rich region.

Roads.—There are good roads serving the towns that have no railroad communication, and some of these roads are suitable for automobile and motor-truck traffic. Then there is a number of cart roads which can be improved to stand the traffic of motor vehicles.

Mail—Telegraph—Telephone.—The City of San Luis Potosi has two telephone companies which serve the city proper and the nearby farms or haciendas.

Offices of the Federal Telegraph System are found in all important towns. The postal service is quite efficient.

SINALOA

Railroads.—The State has only one railroad line, that of the Southern Pacific of Mexico, which extends over 627 kilometers with depots at Francisco, Canedo, Fenochio, San Blas, Metate, Algodon, Naranjo, Toruno, Bamoa, Capomas, Casal, Guamuchul, Acatita, Palos Blancos, Techa, Zapotillo, Retes, Caimanero, Vitaruto, Colorada, Las Juntas, Culiacan, San Rafael, Ahuate, Quila, Barrantes, Oso, Obispo, Abuya, Tanques, Romero, La Cruz, Olaje, Osuna, Dimas, Pozole, Modesto, Redo, Righeti, Mazatlan, Urias, Bonilla, Presidio, Labrados, Mataderos, Rosario, Astengo, Escuinapa, Gacho, Palmar, Copales, Concha. There is a branch line from Quila to El Dorado.

The Kansas City, Mexico and Orient Railroad has a branch line of 103 kilometers within the State of Sinaloa with stations at Topolobampo, Ibarra, Stiwell, Mochis, Constanca, Charay, San Blas, Vegas, Norotes, Fuerte.

A railroad which will be of the greatest importance to this State is being built from Mazatlan to Durango. The following branch lines should be built: from Mazatlan to Rosario, Concordia and Union; from Culiacan to Mocorito, and from Culiacan to San Dimas, the State of Durango. These lines would cross rich mining and agricultural regions.

Roads.—The State has cart roads which lead from the central part or the slopes of the mountains to the towns along the coast; these roads

are gradually made suitable for the automobile traffic.

Mail—Telegraph—Telephone.—The Federal Telegraph System has offices at Mazatlan, Culiacan, Altata, Elota, Fuerte, Sinaloa, Union, Concordia, Rosario, Cosala, San Ignacio, and in a number of places of minor importance.

Telephone service exists at the port of Mazatlan and is being established in other places.

The mail service in the State itself is quite efficient, but letters from outside of the State are delayed on account of the roundabout ways in which they must travel to reach the different sections of the State either on land or by water.

A wireless station has been established at the port of Mazatlan.

SONORA

Railroads.—The principal railroads of the State are the Mexican Southern Pacific; the Kansas City, Mexico and Orient Railroad, and the Cananea line.

The Southern Pacific of Mexico extends over 695 kilometers and has the following railway depots: Nogales, Lomas, Encinas, Agua Zarca, Cibuta, Casita, Quijano, Cumeral, Cerro Blanco, Imuris, Pearson, San Ignacio, Magdalena, Lorenzo, Santana, Gutierrez, Llano, Puerto Querobabi, Camou, Pozo, Carbo, Selva, Aguilar, Pesqueira, Zamora, Alamito, Gandara, Union, Hermosillo, Rio, Willard, Vega, Torres, Lujan, Escalante, Moreno, Tapia, Ortiz, Anita, Santa Rosa, Maytorena, Batamotal, Guaymas, Piedra, Guasimas, Mapoli, Pitahaya, Oroz, Potam, Lencho, Jori, Bacum, Corral, Esperanza, Cajeme, Sochil, Velderrain, Fundicion, Santini, Margarita, Novajoa, Baavachi, Masiaca, Luis, Don.

The Kansas City, Mexico and Orient Railroad has depots at Corral, Tebari, Potrero, Limones, Buena Vista, Picachos, Cuevas, Tubacas, Madera, Cumuripa, Agua Salada, Agua Caliente, Tufanito, Nacimiento, Chollas, Realito, La Gloria, La Dura, Onavas, Toledo, Tonichi. This line extends over 155 kilometers. The Alamos branch line has stations at Navojoa, Tesia, Victoria, Maizal, Ranchito, Minas Nuevas, Alamos. This line is 62 kilometers long. The Nacozari line has stations at Agua Prieta, Cabullona, Cima, Fronteras, Cuchuta, Esqueda, Turicachi, Vigia, Calabazas, El Tajo, San Nicolas, Purica, Hidalgo, Nacozari; its length is 124 kilometers.

Roads.—There are some roads in the State which are being utilized for the motor traffic, but a number of new ones should be built in order to establish rapid communication with such towns as Urea, the ancient capital of the State, and others.

Mail—Telegraph—Telephone.—There are telegraph stations in the most important towns of the State, such as Hermosillo, Cananea, Nogales, Guaymas, Alamos, Altar, Magdalena, Navojoa and others.

A wireless station is established at the port of Guaymas.

Telephone service is gradually being established in nearly all of the most important towns.

The mail service within the State is fairly efficient, even with regard to places located at some distance from the railroad stations. Rapid communication with the center of the Republic will be possible as soon as the San Blas-Guadalajara and the Mazatlan-Durango lines are open for traffic.

TABASCO

Railroads—Roads.—Neither railroads nor highways are found in the State of Tabasco. The roads and means of communication are its magnificent rivers. The centers of population are almost all located on or near the banks of the latter, just as other towns are located at the side of the highways. Tractors and trucks are very little used in this State.

Mail—Telegraph—Telephone.—Telegraph lines are to be found in the principal cities of the State, but the greater number of its towns, haciendas and live-stock farms are without such convenience. There are no telephones.

The mail service is carried on by the steamers as far as the riverside towns, and from there the mail is forwarded by various methods which are not always the most rapid.

TAMAULIPAS

Railways.—The State of Tamaulipas has rapid means of communication with the central and northern parts of the country. The Tampico-Aguascalientes road connecting the State with the central part of the Republic, has within its territory the following stations: Chijo, Mendez, Chila, Ochoa, Tamos and Tampico, running over 45 kilometers. The Monterrey-Tampico line extends over 339 kilometers within the State, having stations at Tampico, Arbol Grande, Earle, Puerta, Altamira, Colonia, Cervantes, Los Esteros, Columbus, Chocoy, Manuel, Gonzalez, Rosillo, Pretal, Osorio, Escandon, Isasi, Forlon, San Francisco, Lavin, Zorrillo, Rosa, Victoria, Caballeros, Ceramica, Carbonero,

Martinez, Santa Engracia, Adelaida, Cruz, Tinajas, Carrizos, Grande, Piedra, Garza Valdes and Summit. The Monterrey-Matamoros line is 50 kilometers long and has depots at Camargo, Valadeces, Cuevas, Arguelles, Anzulduas, Reynosa, Corrales, Rio Bravo, Tenacitas, Canales, Ensenada, Ramirez, Capote, Sandoval, Rosita and Matamoros. A portion of the Mexico-Laredo line is laid in this State. An electric train runs between Tampico and La Barra, with stations at Tampico, Arbol Grande, Dona Cecilia, Talleres, El Aguila, Varadero, Hospital and La Barra.

A new line, Mexico-Tampico, is under construction, already finished up to a point beyond Beristain in the State of Puebla.

New lines should be constructed from Ciudad Victoria to Soto la Marina Mendez, Cruillas, Jaumave, Tula and other places. These would be short lines, the longest being about 90 kilometers, rich sections, the products of which would make the building of such roads a paying proposition.

Mail—Telegraph—Telephone.—The telegraph system is efficient in this State; there are telegraph offices at Matamoros, Camargo, Mendez, Soto la Marina, Ciudad Victoria, Tampico, Tula, Aldama, Jaumave, Nuevo Laredo, Reynoso and in other places. The port of Tampico has a wireless station and a submarine cable office. The city of Tampico has also a splendid telephone system.

The postal service, as a whole, is very efficient in this State.

TLAXCALA

Railroads.—The State is crossed by a few railway lines: the railroad from Mexico to Veracruz touches

at the depots of La Luz, Bernal, Sanz, Trasquila, Mena, Pavon, Velazco, Baquedano, Postigo, Teacoac, Balcon, Rosario, Santo Domingo, Ceron, and Perez, about 89 kilometers of the line being within the State. The San Lorenzo, Puebla, Jalapa and Veracruz train also crosses Tlaxcala, having the depots of Calpulalpan, Mazapa, Tepuente, Nanacamilca, Arroyo, Contadero and Tlalco; it is about 35 kilometers long.

The Mexican Railroad with a length of 36 kilometers within the State serves the State of Tlaxcala at the following points: Apizaco, Tochac, Acoctla, Huamantla. There is a branch line from Tlaxcala to Santana, passing through Apetatitlan. It is operated with animals. The "Ferrocarril Agrícola de Tlaxco" (The agricultural railway of Tlaxco) starts from Apizaco and runs to Tlaxco, and is a railroad which is extremely useful.

Roads.—Roads serve all the towns of the State and are used for autotruck traffic.

Mail—Telephone—Telegraph.—There are telegraphic offices in Tlaxcala, Apizaco, Calpulalpan, Huamantla and other towns. Telephones are beginning to be considered necessary by the inhabitants of these towns and are used in communicating with various haciendas and factories and other places in the towns.

The postal service is fairly good.

VERACRUZ

Railroads.—The first railroad line in Mexico was started from Veracruz, connecting the port of Veracruz with the City of Mexico. The Mexico-Veracruz line has 220 kilometers of track within the State

of Veracruz and the following stations: Perote, Rubin, Cruz Blanca, Las Vigas, Pino, Balastre Negro, Balastre Colorado, Cruz Verde, San Salvador, Ocote, San Miguel, Dehesa, Banderilla, Sedeno, La Cima, Bruno, Cervecería, Jalapa, Pacho, Roma, Munoz, Chavarillo, Tuzamapan, Oscuro, Palmar, Souter, Colorado, Carrizal, Rinconada, Tamarindo, Chichicastle, Paso de Varas, San Francisco, Salmoval, Antigua, Pureza, Vargas, Santa Fe, Buena Vista, Lagarto, Veracruz. The train from Puebla to Veracruz runs over the same track as does the direct train from Mexico City. The Tehuantepec railroad starts from Puerto Mexico towards Salina Cruz, having 147 kilometers within the State of Veracruz and the following stations: Puerto Mexico, Berta, Calzadas, Limones, Carmen, Chinameca, Jaltipan, Velasco, Ojaba, Almagres, Juile, Medias Aguas, Tortugas, Suchil, Santa Lucrecia, Cardenas, and Ubero. The Cordoba-Santa Lucrecia line extends over 331 kilometers, having the following stations: Cordoba, Amatlan, Cuichapa, Xuchiles, Omealca, Presidio, Motzorongo, Tezonapa, Rio Juan Sanchez, Acatlan, Vicente, Tetela, Tierra Blanca, Vista Hermosa, Los Naranjos, Tres Valles, El Hule, Obispo, Loma Bonita, Paso del Cura, Isia, Barranca, El Burro, San Marcos, Juanita, Cascajal, Santa Lucrecia. The Veracruz-Tierra Blanca line extends over 98 kilometers and has the following stations: Veracruz, Los Cocos, Boca del Rio, San Antonio, Piedras Negras, Rio Blanco, Joaquin, Estanzuela, Tierra Blanca. Another line runs between Tres Valles and San Cristobal, 48 kilometers in length, with stations at Carolina, Rancho Nuevo, Coquite, Chacaltianguis, Cosmaloapan and San Cristobal. From the kilometer 20 of this line a branch,

6 kilometers long, with depots at El Burro, La Canada, Cuatotolapan, Laurel, Masumiapa, Tilapan, Ohuilapan, San Andres. The Veracruz-Alvarado line extends over 70 kilometers, with stations at Veracruz, Los Cocos, Espartal, El Tejar, Medellin, Carmen, Guasimal, Paso del Toro, Laguna, La Piedra, Salinas, Camaronera, Buen Pais, Alvarado. The Mexican Railroad runs within the territory of the State of Veracruz for a distance of 165 kilometers, with stations at Boca del Monte, Galera, Alta Luz, Bota, Maltrata, Balastrera, Encinar, Santa Rosa, Nogales, Rio Blanco, Orizaba, Molino, Sumidero, Metlac, Fortin, Cordoba, Pennuelo, Paraje Nuevo, Esmeralda, Potrero, Atoyac, San Allejo, Paso del Macho, Camaron, Mata de Agua, Soledad, La Purga, Mata Loma, Santa Rita, Tejeria, Tembladera, Los Cocos, Veracruz.

A railroad line should be built to connect the rich agricultural section of Jalacingo with the rest of the State.

Roads.—The northern section of the State has good roads; other roads, suitable for the automobile traffic, are being built by the Government.

Mail—Telegraph—Telephone.—All the larger towns in the State have telephone service, as have, of course, all the oil fields. The telegraph net of the State is also quite extensive. The port of Veracruz has a wireless station.

The postal service naturally profits by the many and efficient means of communication, so much so that there is no delay in the distribution of mail all over the State.

There is a submarine cable telegraph line connecting the ports of Veracruz and Puerto Mexico with Galveston.

YUCATAN

Railroads.—The whole railroad system operated in this State belongs to a concern called “Ferrocarriles Unidos de Yucatan”—United Railroads of Yucatan. It extends all over the State. The system comprises four divisions, the central point of all being the city of Merida, capital of the State. The North Division runs over the northern section of the District of Merida, ending at the port and town of Progreso. This line is 36 kilometers long. A branch road, 68 kilometers in length, runs to the town of Tixkokob, and, taking a southern direction, reaches Izamal, where it ends. At certain times of the year electric trains in addition to the ordinary one run over these lines. The West Division starts from Merida, touches at Tixkokob, Motul, Temax, Tzitas, Espita and ends at Tizimin, being 199 kilometers long. A branch of this line starts from Conkal, District of Tixkokob, going as far as Progreso. Another branch starts from Tzitas, District of Espita, ending at Valladolid. The branch road to Progreso is 47 kilometers long and that to Valladolid 180 kilometers. The South Division starts from Merida, touches at Acanceh, Ticul and Tekax and ends at Peto. A branch of this line runs from Acanceh, to Sotuta. The distance from Merida to Peto is 151 kilometers, and from Acanceh to Sotuta 83 kilometers. The West Division starts from Merida, touches at Hunucma and Maxcanu, enters the State of Campeche and terminates at the port and city of Campeche. This Division has two branch roads: one running from Uman to Hunucma, and another which, after touching at Muna, runs as far as Ticul. The distance from Merida to Cam-

peche is 173 kilometers, from Uman to Hunucma, 53 kilometers and from Muna to Ticul 80 kilometers. The only fuel used is wood, while at present most of the other railroad lines in the Republic of Mexico use crude oil, and coal in some sections; there is a general tendency to convert all locomotives into crude-oil burners. This will probably be done in time also on the Yucatan railroads which are among the best in the country. There is a project to build a railroad which, starting from the little town of Peto, would cross the District of this name, enter the Territory of Quintana Roo, and end at Payo Obispo, port and capital town of the Territory. The length of this line would be 270 kilometers. We think the construction of this road offers a splendid opportunity for any railroad builder, since it would open tremendous tracts of the finest land and make possible the systematic exploitation of rich forests.

In the vicinity of all large sisal plantations the State has a number of country tramways drawn by mules, and carrying freight as well as passengers.

Roads.—Fairly good roads are found all over the State, the use of automobiles being possible in practically all of them.

Mail—Telegraph—Telephone.—The mail service in this State is very efficient, since post offices are found in every town and village, with the exception of those that are of no importance.

The telegraph and telephone systems of the Yucatan railroads maintain a regular service between the city of Merida and the fifteen districts of the State. The Yucatan Telephone Company gives good service to the capital of the State, the port of Progreso and the towns of Motul and Acanceh. A good

many plantations have their own telephone lines, which keep them in touch with the neighboring villages.

There is a wireless station at the City of Merida.

ZACATECAS

The State of Zacatecas does not abound in railroad lines. The Central Railroad crosses it from North to South, extending over 300 kilometers and having stations at Berriozabal, Palmira, Troncoso, San Jeronimo, Guadalupe, Zacatecas, El Bote, Pimienta, Calera, Ojuelos, Fresnillo, Mendoza, Gutierrez, Mezquite, Canitas (the starting point of a branch line), Cedro, Edmundo, La Colorada, La Luz, Pacheco, Guzman, Opal, Carlos, Camacho, Fuertes and San Isidro. The line from Canitas to Durango is 164 kilometers in length and has the following railroad depots: Canitas, Vieja, Alazan, Tetillas, Indios, Rio Grande, San Felipe, Pastelera, Santa Monica, Sain Alto, Cantuna, Arenal, Frio, Barajas, Abrego, La Parada, Mena, Canutillo and Boquilla. It has a small branch line from Barajas to Tocayas which extends over 10 kilometers and has one intermediate station at Sombrerete. The small branch line from Concepcion del Oro to Saltillo has only 20 kilometers within the territory of this State.

A new railroad from Zacatecas to Saltillo is under construction and is already complete up to a point beyond Concepcion de Oro. Of this line some 200 kilometers of track will be laid in the State of Zacatecas. In the richest sections of the State, that is in those of Jerez, Valparaiso, Juchipila and others there are no railways; the building of such roads would not be costly but would be very useful. Rail-

ways should also be built to Chalchihuites and Noria. In the northern section they are also needed to transport the products of Nieves and other points.

Roads.—There are no automobile roads in the State, although they could and should be built, to partially remove the difficulties due to the absence of railroads in certain sections of the State. Roads toward Jerez and Troncoso, starting from points south of the city of Zacatecas, such as Troncoso, could extend over a distance of 120 kilometers. Since large areas of flatlands could be utilized, the building of such roads would not involve heavy expenditures.

Mail—Telegraph—Telephone.—The postal service in this State is reliable but somewhat slow in places located far away from the railroad stations.

The city of Zacatecas has telephone service.

Telegraph stations are operating in Zacatecas, Fresnillo, Jerez, Sanchez Roma, San Andres, Sombrerete, Chalchihuites, Rio Grande, Nieves, Mazapil, Concepcion del Oro, Canitas. The railroads have, of course, their own lines.

CHAPTER XII

CITIES AND TOWNS

The object of this chapter is to give an idea of the importance of the cities and towns of the different States. Business people as well as tourists may be stimulated by these data to visit these places for purely commercial purposes or for pleasure. Many of these towns derive their commercial importance, not from the number of their inhabitants, but from the wealth of the surrounding territory.

AGUASCALIENTES

The city of Aguascalientes has 48,000 inhabitants and is the chief commercial, manufacturing and railroad center of the State. It is a city of the old style, with winding narrow streets; its houses are built after the old Spanish fashion. It has several fairly comfortable hotels and a number of beautiful buildings from the architectural standpoint. Among the churches, that of San Antonio, built in modern style, is worthy of mention. The Cathedral is very beautiful. The principal theater of the city is called Teatro Morelos.

Among the points of interest we should mention one which has given its name to the State (Aguascalientes, *i. e.*, Hot Waters), that is to say, the thermal baths. Hot springs, containing sulphurous water, are the following: Ojo Caliente, San Nicolas

de las Canteras, Colombo, Ojo Calentillo, and "Los Arquitos." There are baths at Ojo Caliente and Los Arquitos, which are also very popular places. The best parks are the Parque or "Jardin de San Marcos," the "Plaza de Armas," and the "Calzada de Arellano." The city has about twenty primary schools, but no establishment for higher education; it has a hospital, one regular theater and several moving-picture houses; it has blanket factories, foundries and several other industrial establishments.

Asientos is the second town in importance and has 4,000 inhabitants. Calvillo has 2,300 inhabitants. Tepezala, 2,500 inhabitants. Rincon de Romos, 2,000 inhabitants.

The trade of all these towns is dependent on that of the Capital.

BAJA CALIFORNIA

La Paz is the principal town with 3,000 inhabitants, located on the shore of a magnificent bay; its general conditions are such as to make its developing into a very prosperous city quite possible within the future. Near the town pearl fishing is carried on, its pearl banks being among the richest and most important in the world, not excluding those of Ormuz.

Mexicali, the capital town of the northern District of the Territory, has 3,000 inhabitants. La Paz is the capital of the southern District. Mexicali is of geographical importance, since it is situated on the border line with the United States. It is a commercial center.

Mulege, a mining town, and port for the coast-

wise trade, with good pearl banks in its proximity as well as in Espiritu Santo and San Jose, has 2,000 inhabitants.

Santa Rosalia, a mining center, and port for the coasting-trade, with 4,000 inhabitants, most of which work in the mine of El Boleo.

Ensenada, 2,000 inhabitants: a small port for the coasting-trade.

San Jose del Cabo has 2,000 inhabitants; it is a small port and excellent fishing place; it also has pearl fisheries.

Triunfo, with 2,600 inhabitants, is a mining center.

CAMPECHE

The most important towns in the State are Campeche and El Carmen, the first-named having 15,000 and the other 7,000 inhabitants.

Campeche is the Capital of the State; it is an historical town, since it is the first one founded by the Spanish Conquerors on the Yucatan Peninsula. Its walls, a few remnants of which are still standing and its bastions with a large number of cannons show it to have been once a fortress of considerable importance. Much of its artillery of French origin, probably captured by the Spaniards in their wars with France, was retaken by the French, when their fleet under the command of Counter-Admiral Clou took this fortress at the time of the French intervention. Campeche is a very picturesque town, having a number of fine buildings of the Spanish period, the most important of these being the Cathedral, the San Juan de Dios church and hospital, the St. Joseph church, built by the Jesuits; on the truncated hexagonal tower of this church there is a metereol-

logical observatory and a lighthouse for the guidance of the ocean-going vessels. The city has a theater and several moving-picture houses. The Institute of Campeche for higher studies possesses a library of more than 4,000 volumes and a museum of Natural History. Several tramways, drawn by mules, lead to the farthest outskirts of the city, which are extremely picturesque; there are several fairly good hotels, a Chamber of Commerce and a Chamber of Agriculture, both keeping in touch with similar institutions all over the country. A Normal School for teachers and a pretty large number of primary schools are established all over the State.

CHIAPAS

The principal cities of this State are:

Tuxtla Gutierrez, the Capital, with 10,000 inhabitants, good public buildings, hotels, delightful walks, superb views.

Tapachula, with 9,000 inhabitants: a custom-house; located near the border of the Central American Republic of Guatemala.

Comitan, with 9,700 inhabitants.

San Cristobal, the most populous town and former Capital of the State, called Las Casas in honor of the celebrated Bishop of Chiapas, don Fray Bartolome de las Casas, of imperishable memory on account of his apostolic charity and his successful work for the betterment of the natives.

Tonala, 5,000 inhabitants, with notable haciendas or estates in its neighborhood, most of them raising cattle.

Zacualpa, 4,000 inhabitants: a very important

center on account of its coffee estates, rubber and cacao plantations.

Chiapa de Corzo, of importance for the same reason, and containing about 7,000 inhabitants.

Pichucalco, with 1,000 inhabitants: a busy live-stock-growing center, though not as important as Tonola, is an exporter of timber, carries on agricultural pursuits like the other towns of Chiapas and has good rubber and coffee plantations.

San Bartolome has 4,000 inhabitants and is a place which may become a center of the spinning and weaving industries, as the cotton-tree is plentiful in its vicinity. It is a large producer of agricultural articles.

Soconusco, with 8,000 inhabitants, is a good port on the Pacific and boasts of the best cocoa trade in the Republic. In the neighborhood there are the largest cacao plantations; it exports cacao beans to the value of \$1,750,000 a year.

CHIHUAHUA

The principal towns of the State are:

Chihuahua, the Capital of the State, with 48,000 inhabitants, located in a vast plain, with large and well-built streets; it has many important and beautiful buildings, a number of schools, churches, hospitals, sanatariums, public parks, theaters, moving-picture houses, etc. The city is of historical importance, because the first fighters in the Mexican War of Independence: Hidalgo, Allende, Aldama, Abasolo, were shot here by the Spaniards. It has a large foundry, machine shops, a large brewery and is a busy commercial center.

Parral, with 15,000 inhabitants, is a very impor-

tant mining center and a producer of cattle, cereals and other agricultural articles.

Jimenez, with 8,600 inhabitants, is a flourishing agricultural center; it is famous for its "perones" (*pyrus malus*), a kind of apple, that grows here, known under the name of "peron del Valle."

Ciudad Guerrero, with 8,000 inhabitants, is an agricultural center.

Batopilas, 3,400 inhabitants, is an agricultural and mining town.

Camargo, 9,000 inhabitants, is a manufacturing and agricultural center.

Casas Grandes, 6,000 inhabitants, is an agricultural town.

Colonia Dublan, 1,000 inhabitants, is a flourishing agricultural center.

Cusihuiachi, 1,300 inhabitants, is an important mining and agricultural center.

Madera, with 5,000 inhabitants, is an agricultural center.

Nuevas Casas Grandes, 1,400 inhabitants, grows agricultural products.

Temosachi, 1,000 inhabitants, is a producer of cereals.

COAHUILA

The following are the most important towns in this State:

Saltillo, Capital of the State, with 35,000 inhabitants; it is a picturesque and beautiful place, of an agreeable cool climate, very healthy, with many places worth visiting, as for example, its gardens, the Alameda Zaragoza, El Chorro, a waterfall near Cienega de Flores; it has a large number of most beautiful buildings, schools, hotels, theaters, hos-

pitals and a large number of prosperous business houses.

Monclava, with 8,000 inhabitants; it has good hotel accommodations, theater, picturesque sights and parks in its vicinity; it is a good commercial place.

Piedras Negras, with 10,000 inhabitants; it exports coal coming from the mines of Las Esperanzas, La Rosita, Cloetes, Palau and Fuentes.

Cuatro Cienegas, 5,000 inhabitants; has fine vineyards and exports "guayule," a rubber-producing shrub; it has also important cattle ranches.

Sabinas, with somewhat more than 6,000 inhabitants: a mining center.

Viesca, 4,500 inhabitants: also a mining town.

Sierra Mojada, 11,000 inhabitants: a mining center.

Parras, with 7,000 inhabitants: the center of the grape wine producing section; it has a most beautiful landscape.

Torreón, with 40,000 inhabitants: the principal commercial, railroad and industrial center of the State; it is a beautiful and very important place, of great commercial activity.

COLIMA

The principal centers of population of this State are:

Colima, with 30,000 inhabitants: a beautiful and very active industrial center; its central park with its various species of palm-trees is particularly beautiful; its foundries and machine shops are quite important.

Comala, 2,000 inhabitants: an important agricultural center.

Coquimatlan, 600 inhabitants; it derives its importance from its saltpits and from the fact that it is one of the places in the country that exports large quantities of coconuts.

Cuyutlan, 500 inhabitants: produces salt and coconuts.

Mamey, 6,500 inhabitants: a prosperous agricultural center.

Manzanillo, with 2,400 inhabitants: a beautiful port on the Pacific Ocean.

Tecoman, with 600 inhabitants: an agricultural center.

Tepames, with 2,000 inhabitants: a prosperous agricultural center.

Villa Alvarez, 3,000 inhabitants: also an agricultural center.

DISTRITO FEDERAL

The City of Mexico is the Capital of the Republic of Mexico, located in a level plain; it has about 700,000 inhabitants and is one of the most beautiful cities on the American Continent; it has a number of wonderful parks, the one of Chapultepec being second to none in the world. The City of Mexico is in every sense of the word an absolutely modern city, and, of course, the principal political and commercial center in the Republic. The National Theater, of the finest marble throughout, still under construction, will be one of the greatest and most beautiful edifices on the globe; the city has a large number of other theaters and moving-picture houses, a number of most interesting museums, libraries and modern schools, high schools, colleges and universities, private as well as under the direction of the Government. Mexico City is, of course, the seat of

the Federal Government with all the corresponding Ministries and Departments; it is an agreeable and very healthy place to live in; all modern conveniences and comforts, such as hotels, restaurants, amusement places, hospitals and sanitariums are found here. The residential sections of the city are enchanting. The landscape around the city is unequaled.

The other most important cities of the Federal District, all connected with the City of Mexico by the splendid services of the finest electric car system that could be desired, are really suburbs of the City of Mexico, and taken together, constitute what might be called "Greater Mexico":

Tacubaya, with 75,000 inhabitants.

Mixcoac, 30,000 inhabitants.

San Angel, 9,000 inhabitants.

Xochimilco, 12,000 inhabitants.

Tacuba, 50,000 inhabitants.

Atzacapozalco, 24,000 inhabitants.

Ixtapalapa, 10,000 inhabitants.

Guadalupe Hidalgo, 29,000 inhabitants.

Tlalpam, 50,000 inhabitants.

Coyoacan, 18,000 inhabitants.

Near the city of Tacubaya there is a forest which is a very popular gathering place for the excursionists of the City of Mexico; the landscape in this section, around Xochimilco with its floating gardens, as well as in the neighborhood of the other towns, offers the most delightful views.

DURANGO

Durango is the Capital of the State; it has 40,000 inhabitants, fine public buildings, 20 primary schools,

two colleges for higher studies, a law school, a school for teachers called Normal School, a hospital and various sanitariums, hotels and a fine theater still under construction.

Gomez Palacio has 15,000 inhabitants; it is an industrial center.

Ciudad Lerdo has 8,000 inhabitants: a busy commercial town.

Santiago Papasquiaro, with 5,000 inhabitants; it is an important agricultural center.

There are other small towns of minor importance, such as San Juan del Rio, Nazas, Cuencame, San Juan de Guadalupe, Nombre de Dios.

GUANAJUATO

The principal cities and towns of commercial importance are the following:

Guanajuato, Capital of the State, with 35,000 inhabitants; it produces cereals and is the center of rich gold, silver and copper mines; it has a number of fine buildings, some of historic value, as the castle of Granaditas, for example; also a number of fairly good hotels.

Leon, with 54,000 inhabitants: great industrial center, located in a large plain, producing all kinds of cereals, etc. It is a center of the leather industry, famous for its high grade shoes and much-valued riding saddles; it is built after the ancient Spanish type, with crooked, narrow streets; it has important weaving and spinning mills, factories making felt and palm hats.

Celaya, with 30,000 inhabitants: center of a rich agricultural and cattle-raising section; famous for its fruit-jelly or paste; it has a number of edi-

fices of architectural value. There are also weaving and spinning mills, flour mills and palm-hat factories.

Irapuato, one of the most important railroad centers, with 23,000 inhabitants; it is essentially an agricultural center, but has also large machine shops, tanneries, etc.

Acambaro, 21,000 inhabitants: an agricultural center, having also important machine shops and other factories.

Silao, with 13,000 inhabitants: an agricultural center, having several factories.

Salamanca, with 12,000 inhabitants: an agricultural town.

Salvatierra, 10,000 inhabitants: an agricultural center.

Valle de Santiago, 10,000 inhabitants: located within a very fertile section producing cereals.

Yuriria, 2,300 inhabitants: produces cereals.

Uriangato, 2,000 inhabitants: a cereal and fruit-growing center.

San Miguel de Allende, 10,000 inhabitants: an agricultural and industrial center.

San Luis de la Paz, 11,000 inhabitants: a mining and manufacturing center.

Rincon, 9,000 inhabitants: an industrial, cattle-raising and agricultural center.

San Felipe, 6,000 inhabitants: an agricultural town.

Romita, 2,400 inhabitants: a fruit-producing and agricultural center.

Pueblo Nuevo, 5,000 inhabitants: an agricultural center.

Penjamo, 9,000 inhabitants: an agricultural and cattle-raising center.

Moroleon, 4,600 inhabitants: a cereal, fruit and cattle-raising center.

Jaral del Valle, 8,500 inhabitants: important agricultural center.

Dolores Hidalgo, 7,000 inhabitants: an historical and old industrial town.

GUERRERO

The following are the most important commercial centers of this State:

Chilpancingo, the Capital of the State, with 10,000 inhabitants: it is of historical importance.

Acapulco, 9,800 inhabitants: the principal seaport of the State.

Ayutla, 3,000 inhabitants: a producer of fruit and agricultural articles.

Iguala, 12,000 inhabitants: an automobile road leads from here to the Capital of the State; it is an agricultural center; it has an important iron foundry, vegetable-oil mills, and exports opals, marbles, etc.

Chilapa, 11,000 inhabitants: exports oil and aloe (linaloe) and the largest quantity of palm hats that leave this State for points in the interior of the Republic.

Tixtla, 9,900 inhabitants: a very important agricultural center; it also exports palm hats.

Huamuxtitlan, 1,600 inhabitants: a rice and sugar-producing center.

Taxco, 3,000 inhabitants: it is the principal mining center of the State.

Tecpan, 1,700 inhabitants: an important agricultural center.

Teloloapan, 7,000 inhabitants: an agricultural center.

Tlapa, 3,000 inhabitants: it is also an agricultural center.

Ometepec, 4,600 inhabitants: an agricultural and cattle-raising center.

Coyuca, 2,300 inhabitants: an agricultural center.

HIDALGO

Pachuca is the Capital of this State; it has 40,000 inhabitants; it is a hilly city, as are nearly all mining cities, and has important business houses and public buildings and some beautiful walks. It has several foundries.

Real del Monte has 8,000 inhabitants and famous mines.

Actopan, at the foot of the mountain range, called the "Organos of Actopan," of eruptive origin, has 2,000 inhabitants.

Huejutla, in the section called the "Huasteca of Hidalgo," has 2,500 inhabitants, beautiful orchards and fine views.

Tulancingo, 9,000 inhabitants: a manufacturing town, in which the ancient Toltec traditional skill in making pottery has been maintained; it has the best weaving and spinning mills and is one of the best commercial centers in the State.

Tula: here are located the Aztec Portland Cement Works and various flour mills.

Secualtipan, 2,300 inhabitants.

Zimapan, 1,500 inhabitants: this and Semaltipan are quite important business centers.

JALISCO

The principal business centers of this State are:

Guadalajara, the Capital of the State, with

175,000 inhabitants, is in every respect a modern and most beautiful city; it is chiefly an agricultural center.

Ciudad Guzman, with 23,000 inhabitants: the center of a sugar-cane and cereal-producing section.

Ocotlan, 16,000 inhabitants: the center of a fruit and cereal-producing section.

San Juan de los Lagos, 5,800 inhabitants: a cattle-raising and agricultural center.

Sayula, 12,500 inhabitants: an agricultural center.

Ameca, 10,000 inhabitants: an agricultural center.

Autlan, 15,000 inhabitants: also an agricultural center.

Ayutla, 12,000 inhabitants: the center of a cereal-producing section.

Bolanos, in a cereal-producing section.

Chapala, 3,000 inhabitants: an agricultural town located on the lake of Chapala and is therefore also a busy summer and bathing resort.

Colotlan, 7,500 inhabitants: center of an agricultural section.

Cuautla, 3,600 inhabitants; in its environs dairy products and cereals are obtained.

Cuquio, 3,200 inhabitants: is the center of a flax, wheat, barley and vegetable-producing section.

Encarnacion de Diaz, 5,400 inhabitants; it is the center of an agricultural section.

Etzatlan, 3,100 inhabitants, serves as the center for a cereal-producing region.

Jamay, 1,700 inhabitants; cereals are produced in this region.

Juanacatlan, 8,500 inhabitants: located within an important agricultural section.

La Barca, 11,000 inhabitants: famous for its dairy products.

Lagos de Moreno, 13,000 inhabitants; located within a very important agricultural section.

Manzanilla, 1,200 inhabitants; serves as an agricultural and cattle-raising section.

Mascota, 5,400 inhabitants; the center of a cereal and tobacco-producing region.

Meztican, 3,100 inhabitants; within a cereal-producing section.

Poncitlan, 8,000 inhabitants; a fruit and cereal market.

San Marcos, 4,000 inhabitants; cereals and fruit are produced in its environs.

San Sebastin, 4,000 inhabitants; an agricultural center.

Zala, 2,800 inhabitants; located within an agricultural section.

Tapalpa, 2,000 inhabitants; supplies flax, cereals and fruit.

Tenamaxtlan, 3,000 inhabitants; within an agricultural section.

Teocaltiche, 3,000 inhabitants; the center of an agricultural section.

Teocuitatlan, 4,000 inhabitants; an agricultural center.

Tequila, 3,500 inhabitants; within a fruit and cereal-producing region.

Tepatitlan, 1,400 inhabitants; serves as a section that produces cereals and fruits.

Tomatlan, 1,000 inhabitants; the center of an agricultural region.

Tonaya, 2,200 inhabitants; cereals are cultivated in this region.

Tonila, 1,300 inhabitants; within a cereal-producing section.

Tuxcacueso, 1,300 inhabitants; a market for cereals.

Tuxpan, 5,300 inhabitants: serves as a cereal-producing region.

Yuhualica, 3,000 inhabitants.

Zacoalco, 2,000 inhabitants.

Zapotitlan, 10,000 inhabitants.

Zapopan, 2,300 inhabitants.

Zapotlanejo, 3,500 inhabitants; all these towns are the centers of important and rich agricultural sections which chiefly produce cereals.

MEXICO

Toluca, the Capital of State, has 35,000 inhabitants, and is situated in a most beautiful valley with marvelous views; it is a great manufacturing and agricultural center.

Amecameca, with 7,000 inhabitants, is situated in the vicinity of the large paper mills of San Rafael; it has a rather cold climate for the reason that it is located at the foot of the volcanoes; it has a wonderful landscape.

Zumpango, a town of 6,000 inhabitants and situated on the shore of a lake bearing the same name; it chiefly devotes itself to fishing; it is famous for its beautiful views.

Texcoco, ancient capital of the Chichimecan Indians, lies on the shores of the Texcoco lake, now almost completely drained; has 5,000 inhabitants; the people are mostly engaged in agriculture and fishing.

Valle de Bravo, 5,000 inhabitants, has a foundry and important flour mills.

Temascaltepec, 3,000 inhabitants.

Tenancingo, 6,000 inhabitants: both an industrial and agricultural center.

Zacualpan is a mining town with 3,200 inhabitants.

Sultepec, 3,000 inhabitants: a mining center.

Tenango, 6,000 inhabitants: a commercial center.

Ixtlahuaca, 2,500 inhabitants; the town is famous for its sulphuric hot-water springs.

Chalco has attractive landscapes and a population of 2,000 people.

Tlalnepantla, with 3,000 inhabitants, lies at a distance of an hour's ride by the train from Mexico City. It is popular as an excursion place.

El Oro is the second largest town in the State, having 20,000 inhabitants; it is a rich mining and important commercial place.

MICHOACAN

The principal centers of population of this State are:

Morelia, the Capital, a beautiful city with 45,000 inhabitants; it is located in a wonderful valley through which runs the Morelia river.

Uruapan, with 12,000 inhabitants; near this city are the celebrated and enchanting falls of Zararacua.

Zamora, 14,000 inhabitants.

Patzcuaro, 6,000 inhabitants.

Sahuayo, 8,000 inhabitants.

La Piedad Cabadas, 9,600 inhabitants.

Tlalpujahua, 10,000 inhabitants.

Tacambaro, 4,000 inhabitants.

Zinapacuario, 2,000 inhabitants.

Zitacuaro, 5,000 inhabitants.

Anganguero, 5,000 inhabitants.

Maravatio, 3,000 inhabitants.

Los Reyes, 2,000 inhabitants.

Cotilo, 3,000 inhabitants.

All these towns are of importance as centers of trade.

MORELOS

The most important business centers of this State are:

Cuernavaca, the Capital of the State, with 12,000 inhabitants.

Cuautla, with 6,400 inhabitants, has sulphur springs; it is an agricultural center.

Yuatepec, with 6,300 inhabitants, lies within an agricultural region and the most prosperous cattle-raising section of the State.

Tetecala, with 2,000 inhabitants; it is the center of a rich agricultural section. In the vicinity of this town are situated the famous grottoes of Carahua-milpa.

Puente de Ixtla, with 1,500 inhabitants; being located at the intersection point of several railroad lines, it is bound to develop into an important commercial place. It possesses sources of thermal waters and is the center of an important agricultural section.

NAYARIT

Tepic, the Capital of the State, has 18,000 inhabitants; it is an attractive and healthy place and the center of a coffee, tobacco and cereal-growing region.

Santiago Ixcuintla, with 6,000 inhabitants; tobacco, coffee, cotton and cereals are cultivated in the surrounding territory.

San Blas, 2,000 inhabitants, is a port of entry, and

the center of a region devoted to the cultivation of coffee, tobacco, coconut-trees, cacao, cotton and sugar-cane.

Jalisco, 4,000 inhabitants: an agricultural center.

Ixtlan, 6,000 inhabitants: located within an important farming section.

Compostela, 3,000 inhabitants: the center of a rich agricultural region.

Ahuacatlan, with 1,500 inhabitants: a farming center.

Acaponeta, with 2,200 inhabitants: the center of a wealthy farming section.

NUEVO LEON

This State has many very important business towns; they are:

Monterrey, the Capital of the State, has 96,000 inhabitants; it is an important railroad center and a beautiful modern city with all the corresponding institutions, buildings and conveniences; it is an agricultural center and an active business town.

Linares, with 13,000 inhabitants; it is an agricultural center and an active business town.

Montemorelos, 7,000 inhabitants: located within a rich farming section.

Lampazos, 7,000 inhabitants; it has flour mills, and cotton, wheat and other cereals are cultivated in the surrounding territory.

General Trevino, with 2,000 inhabitants: devoted to the cultivation of sugar-cane and cereals.

Galeana, with 5,000 inhabitants; it lies within an important farming region.

Doctor Arroyo has 5,200 people: mostly devoted to farming.

Cadereyta, with 7,000 inhabitants: mostly engaged in growing sugar-cane and cereals.

Sabinas Hidalgo, with 7,600 inhabitants, is the center of a very important farming section.

Villaldama, with 6,700 inhabitants: located within a good farming section.

OAXACA

The principal commercial towns of this State are:

Oaxaca, the Capital, with about 40,000 inhabitants, is located on the banks of the Atoyac or Verde river, has most beautiful views, with some factories making different articles, as explained in the chapter on Industries; it has a flourishing trade.

Tehuantepec has 12,000 inhabitants and is located within a large coffee-producing center.

Salina Cruz, a port on the Pacific Ocean, with 6,200 inhabitants, a busy place, especially since the completion of the Tehuantepec railroad.

Huajuapán de León, 9,000 inhabitants, with excellent agricultural opportunities and every probability of great prosperity as soon as its coal deposits are tapped and exploited.

Puerto Ángel, on the Pacific Ocean, of 3,000 inhabitants, has a fine large bay capable of accommodating vessels of considerable size; it is quite possible to convert this place into a real harbor and make it a maritime port of importance; at the present time it depends chiefly on agricultural activity. Fine cattle and excellent rice are produced in this section.

Tlacolula, with 5,000 inhabitants, has very great natural resources; it has rich strata of good marbles, and is at a short distance from the celebrated Mitla ruins.

Tlaxiaco, with 7,400 inhabitants, is an attractive town and also does some mining.

Ejutla, with 3,800 inhabitants, is located in a beautiful valley of the same name, which abounds in the nopal plant, offering nourishment to the cochineal insects, which yield a coloring matter used in manufacturing. The castor-oil plant abounds also in this section.

Ocotla has 3,200 inhabitants and is a rich mining camp, or should be so, since it is not being operated; at present it is rather an agricultural center.

Tuxtepec, which has 3,400 inhabitants, and

Juchitan, which has 14,000 inhabitants, are both centers of large and rich farming sections.

PUEBLA

The City of Puebla, the Capital of this State, ranks third among the cities of the Republic of Mexico; it has 140,000 inhabitants and is a great industrial and commercial center.

Tehuacan has 9,000 inhabitants, being noted for its sulphurous thermal baths; it is a prosperous industrial town.

Huejotzingo, with 3,500 inhabitants, is surrounded by splendid forests and does an important timber business.

Zacapoaxtla, located within the thickest part of the sierra, engages in the same kind of industry.

Teziutlan, with 10,000 inhabitants, also does important business in the timber industry; it has several mines, but engages principally in cattle-raising.

Zacatlan, 9,000 inhabitants, is an agricultural and manufacturing center.

Atlixco, 10,000 inhabitants, has onyx deposits or layers and flour mills.

Acatlan, with 1,800 inhabitants, produces fruit and coffee.

San Martin Texmelucan, cultivates cotton and has the most important wheat and corn-growing farms in the State.

Matamoros Izucar, 6,500 inhabitants, is the center of a rich agricultural section.

Tepeaca, 2,100 inhabitants; it mines onyx and marble, and a fine variety of gypsum.

San Juan de los Llanos, 6,000 inhabitants, produces onyx, salt and gypsum, and lies in a prosperous stock-farming and agricultural district; it has several silver and gold mines and coal veins.

Tecali, 1,800 inhabitants: famous for its fine onyx and marble.

Chiautla, 2,700 inhabitants: a farming section.

Cholula, 6,000 inhabitants; it is situated near the pyramid of the same name, representing ruins of an ancient people imperfectly known up to the present time; the region is chiefly agricultural.

San Andres Chalchicomula, 5,000 inhabitants, serves a rich agricultural section.

QUERETARO

Queretaro is the Capital of the State; it has 34,000 inhabitants and is of great historical importance. In its vicinity is situated the hill called "Cerro de las Campanas," on which Emperor Maximilian and his two brave generals, Miramon and Mejia, were shot to death, and, where the Constitution under which Mexico is at present governed was formulated. Queretaro is an interesting city, since it

represents in its buildings and streets the true type of a town of Colonial times; it has a number of very interesting sights.

San Juan del Rio, with 11,000 inhabitants; it is a good farming center and the people of this town are very fond of manufacturing all kinds of toys.

Cadereyta, 20,000 inhabitants; it is the center of a mining and agricultural region.

Amealca, 3,000 inhabitants; the surrounding country places engage in agricultural enterprises.

Jalpan, 4,000 inhabitants; in this section much wheat is produced.

Pinal de Amoles, 2,400 inhabitants; it is the center of a farming district.

Tesquisquiapan, 3,400 inhabitants; it has good mines and farms.

Tolimán, with 4,000 inhabitants, is also the center of a rich farming district.

QUINTANA ROO

Payo Obispo, with 1,500 inhabitants, is the capital of the Territory.

Santa Cruz de Bravo, the former capital of the Territory, is in the hands of the Indians, who are not very much inclined to recognize the authority of the Mexican Federal Government. This village, as well as the attitude of these Indians, is of no importance.

There are also the villages or settlements of Bacalar, Puerto Morelos, Puerto Madero and Xcalak, all places of scarcely any importance.

SAN LUIS POTOSI

The most important centers of population are:

San Luis Potosi, the Capital of the State, has

100,000 inhabitants, which makes it the fourth place of importance in the Republic. The city is very interesting and attractive to travelers as well as to the people residing there permanently; it is, of course, one of the most prosperous and greatest business centers of the country.

Matehuala, 20,000 inhabitants, is an important mining and commercial center.

Cedral, with 5,000 inhabitants, is a mining center.

Santa Maria del Rio, 6,500 inhabitants, has good shawl factories.

Cerritos, 4,000 inhabitants.

Catorce, with 7,000 inhabitants.

Rio Verde, with 9,000 inhabitants.

Salinas, 4,000 inhabitants.

Ciudad del Maiz, with 8,000 inhabitants, and a number of others, such as Tancuanhuitz, Tamasunchale, Ciudad Valles, though in a lesser degree, are all important commercial places.

SINALOA

The following are the most important business centers:

Culiacan, the Capital of the State, has 15,000 inhabitants; to some extent it is an industrial center, but on the whole the surrounding country is devoted to agriculture.

Mazatlan, with 30,000 inhabitants, is a beautiful port on the Pacific Ocean.

Rosario, 3,000 inhabitants: the center of a farming section.

Sinaloa, 1,300 inhabitants, serves an agricultural region.

San Ignacio, 3,000 inhabitants: the center of a farming region.

Mocorito, 2,700 inhabitants, lies in a prosperous farming region.

Fuerte, 2,400 inhabitants: serves a region where fruit, cereals and garden vegetables are produced.

Elota, 1,000 inhabitants: also the center of a farming section.

Cosala, 2,800 inhabitants; located in a fruit and cereal-producing region.

Concordia, 3,000 inhabitants; fruit and cereals are cultivated in this section.

Badiraguato, located in a fine farming section.

Angostura, 900 inhabitants: located in a rich farming region.

Altata, 1,000 inhabitants.

Ahome, 3,200 inhabitants.

Topolobampo, 1,000 people.

Union, 1,400 inhabitants; all these towns are the centers of prosperous agricultural sections.

SONORA

Hermosillo, the Capital of the State, has 15,000 inhabitants; it is an active commercial center, and its favorable geographical location permits it to act as a center of the export and import trades.

Ures, 3,000 inhabitants.

Santana, 2,100 inhabitants.

Sahuaripa, 1,400 inhabitants.

San Javier, 1,000 inhabitants.

Nogales, 8,000 inhabitants.

Nacozari, 6,000 inhabitants.

Magdalena, 2,400 inhabitants; all these towns are centers of very rich agricultural districts.

Guaymas, 6,500 inhabitants: a port in the Gulf of Cortes, with a fine bay and facilities for anchorage; fruit, especially oranges, and cereals are cultivated in this section.

Cocorit, 2,000 inhabitants; in this section chiefly garavance or chick-peas and cereals are grown.

Cananea, 5,000 inhabitants: a great mining center and a thriving business place.

Altar, 2,600 inhabitants: the center of an agricultural section.

Alamos, 2,000 inhabitants; in this section chiefly garavance and cereals are grown.

Agua Prieta, 1,600 inhabitants, located in a cereal-growing section.

TABASCO

Only two of the towns of the State of Tabasco merit special attention:

Villahermosa, with 12,000 inhabitants; its scenery is delightful, situated as it is on the banks of the Grijalva river. Vessels of large draught come right up to the town; it is the Capital and the most important commercial town of the State.

Frontera, with 2,500 inhabitants, is the port of the State on the Gulf of Mexico. It is not a good port, as it is constantly obstructed by enormous banks of sand which are removed from time to time; the small town lies at the mouths of the two united rivers Grijalva and Usumacinta.

Other less important towns of the State are:

Tenosique, 2,000 inhabitants, on the frontier between the State of Tabasco and the Republic of Guatemala, Central America.

Huimanguillo, 3,400 inhabitants.

Cunduacan, 1,900 inhabitants.

TAMAULIPAS

The cities and towns of interest from the business standpoint are:

Ciudad Victoria, the Capital, with 13,000 inhabitants; it is a picturesque town, offering beautiful views. Its inhabitants engage mostly in agricultural pursuits.

Tampico, with over 90,000 inhabitants: a port on the Gulf of Mexico, near the mouth of the river Panuco. Its growth and prosperity depend entirely on the petroleum industry in this section of the country.

Matamoros, 8,000 inhabitants: a port on the river Bravo, a few miles from the mouth of the river; the people are devoted to the growing of cotton, cereals and some fruit.

Nuevo Laredo, 6,000 inhabitants: the center of an agricultural section.

Reynosa, 1,400 inhabitants, in a farming section.

Tula, 6,700 inhabitants: a manufacturing and farming center.

Jaumave, 2,500 inhabitants: also an industrial and agricultural center.

Soto la Marina, 12,000 inhabitants; it lies in a farming district, and in its vicinity salt and asphalt are obtained.

La Barra, 2,000 inhabitants, is a bathing resort.

TLAXCALA

The principal towns of this State are:

Tlaxcala, the Capital of the State (for historic reasons), has 2,900 inhabitants.

Santa Ana, 5,000 inhabitants: a good manufacturing center.

Huamantla, 6,200 inhabitants; it is located in the valley of the same name and possesses some beautiful views; its people are mostly devoted to agricultural pursuits.

Tlaxco, 2,000 inhabitants: a farming center.

Zacatelco, 4,500 inhabitants, is a farming town.

Calpulalpan, 3,000 inhabitants, has barley, wheat and corn cultivations.

Apizaco, 15,000 inhabitants: also the center of an agricultural section.

VERACRUZ

The following are the principal and most important business centers of this State:

Veracruz, the most important commercial port of the country, has 40,000 inhabitants.

Puerto Mexico, 3,800 inhabitants (some claim it has 5,000 people): an active commercial center.

Tuxpan, 7,000 inhabitants: one of the ports that export petroleum.

Orizaba, a very beautiful city, situated amid the most enchanting landscapes, is a prosperous agricultural, industrial and commercial center.

Cordoba, 8,500 inhabitants, a rich agricultural center.

San Andres Tuxtla, 9,500 inhabitants; it is the center of the region where the best Mexican tobacco is produced. In its vicinity wealthy cattle ranges are located.

Coatepec, 8,000 inhabitants: near a splendid waterfall (the Xico Fall).

Huatusco, 6,500 inhabitants: a cattle, fruit, coffee and sugar-producing center.

Tlalcotalpan, with 6,000 inhabitants: an important sugar-producing center.

Santiago Tuxtla, 5,600 inhabitants: a cotton and rice-producing center.

Santa Lucrecia, 1,300 inhabitants: the center of a farming section.

Coscomatepec, 4,200 inhabitants: the center of a coffee-growing region.

Jalacingo, 4,100 inhabitants: an agricultural center.

Jalapa, 10,000 inhabitants: an agricultural center and the capital of the state.

Papantla, 7,300 inhabitants: the center of a rich agricultural and oil-producing section.

Misantla, 6,900 inhabitants: an important center of petroleum and agricultural industries.

Naolinco, 3,200 inhabitants: located in a rich farming section.

Alvarado, 5,000 inhabitants: a port for the coasting-trade and an important agricultural center.

Minatitlan, 3,600 inhabitants: the center of a farming and great petroleum-producing section.

Acayucan, 3,000 inhabitants: sugar-cane, coffee and rice are produced in this section.

Amatlan, 2,800 inhabitants: coffee, corn and especially petroleum are obtained in this region.

Banderilla, 1,400 inhabitants: an agricultural center.

Boca del Rio, 1,200 inhabitants: in a sugar-cane-growing section.

Catemaco, 1,000 inhabitants: in a coffee-producing region.

Chacaltianguis, 1,100 inhabitants: an agricultural center.

Chicontepec, 3,600 inhabitants: the center of a farming district.

Chinameca, 900 inhabitants: an agricultural district.

Cosautlan, 1,400 inhabitants: in a tobacco and coffee-producing district.

Cosamaloapan, 3,300 inhabitants: in a coffee and tobacco-growing district.

Cuichapa, 1,000 inhabitants: in a rich farming section.

Gutierrez Zamora, 3,400 inhabitants: vanilla, coffee and sugar-cane grow in this section.

Martinez de la Torre, 1,600 inhabitants: in a coffee-growing district.

Medellin, 2,200 inhabitants: sugar-cane and rice grow in this section.

Nogales, 6,800 inhabitants: tobacco, coffee and sugar-cane grow in this region.

Perote, 3,200 inhabitants: the center of an agricultural district.

Rio Blanco, 8,500 inhabitants: in a rich farming district.

San Juan Evangelista, 9,000 inhabitants, in a rich coffee and sugar-producing district.

San Lorenzo Cerralvo, 2,600 inhabitants: in a sugar-cane producing section.

Santa Rosa, 6,300 inhabitants; it is in a farming district and has coal mines.

Soledad Doblado, 2,000 inhabitants; the center of a rich agricultural region.

Teocello, 1,600 inhabitants.

Tierra Blanca, 1,400 inhabitants.

Zongolica, 5,300 inhabitants; all of the above are agricultural centers.

YUCATAN

The principal cities and towns of commercial interest are:

Merida, the Capital of the State, with 70,000 in-

habitants, is one of the most beautiful cities in the country. It is a very prosperous agricultural, industrial and commercial center.

Progreso, 7,000 inhabitants, is the port of entry of the State and also a good business place.

Other places of some commercial importance are: Motul, Valladolid, Izamal, Ticul, Tekax.

ZACATECAS

Zacatecas, the Capital of the State, has at present 10,000 inhabitants; in former more prosperous days it used to have as many as 50,000. Important mines are located in its district.

Sombrerete, with 8,000 inhabitants, is also a mining center.

Ciudad Garcia, formerly called Jerez, with 6,000 inhabitants.

Fresnillo, 5,000 inhabitants.

Juchipila, 2,800 inhabitants.

Nieves, 2,400 inhabitants.

Ojo Caliente, 2,000 inhabitants.

San Miguel del Mezquital, 4,300 inhabitants.

Pinos, 6,000 inhabitants.

Tlaltenango, 2,200 inhabitants; all these places were very important in the past, and probably will rise again to prosperity under the influence of more favorable conditions in the future.

SUPPLEMENT

APPENDIX I

ALPHABETICAL LIST OF
ARCHAEOLOGICAL RUINS

<i>Name and Location of the Ruins:</i>	<i>State:</i>	<i>What They Represent:</i>	<i>Ethnological Significance:</i>
Ac	Yucatan	Ruins of edifices.	Mayan civilization.
Acámbaro	Guanajuato	In the neighborhood of this place there is a hill, on the side of which many archaeological objects are buried.	Tabascan civilization.
Acanceh	Yucatan	Temples.	Mayan civilization.
Aguascalatlán	Puebla	General ruins.	Not definitely known.
Ake	Yucatan	A pyramid.	Mayan civilization.
Alvarado	Veracruz	The ruins of a town and sepulchres are found near the town on the southern side of the estuaries formed at the mouth of the Papoalapan river.	Totonacan civilization.
Apaceo	Guanajuato	In the vicinity of this town there are sep-	Aztec civilization.

<i>Name and Location of the Ruins:</i>	<i>State:</i>	<i>What They Represent:</i>	<i>Ethnological Significance:</i>
Apaceo (<i>Cont.</i>)	Guanajuato (<i>Cont.</i>)	ulchres in which a rich farmer found a cloak made of plumes, and other important objects.	
Atlachualayan, near Cuautla.	Morelos	Ruins of edifices.	Aztec civilization.
Atlixco	Puebla	On the <i>hacienda La Concepción</i> , sepulchres and the base of a temple are found.	Totonacan civilization.
Barra de Santecomapan	Veracruz	Many objects are found in the sepulchres.	Mayan civilization.
Burras. (See "Hacienda de Burras")			
Cabeza Colosal	Veracruz	A monument known as "Cabeza de Hueyapa."	Totonacan civilization.
Calixtlahuaca	Mexico	On a hill there are the ruins of a town in which objects of gold, silver, copper, rock crystal and amethysts are buried. Some years ago an armor plating made of solid silver was found having eagle feathers engraved on it; on the summit of this same hill an idol was discovered having	Matlacincan civilization

<i>Name and Location of the Ruins:</i>	<i>State:</i>	<i>What They Represent:</i>	<i>Ethnological Significance:</i>
Calixtlahuaca (<i>Cont.</i>)	Mexico (<i>Cont.</i>)	the body of a woman, the head representing a skull crowned with small human skulls; a diadem of gold was also found there. All these objects are on exhibition in the National Museum of Mexico City.	
Canoas (See "Ranas")			
Casas Grandes	Chihuahua	Ruins of edifices.	Toltec civilization.
Castillo de Teoyo.	Veracruz	Base of a teocalli, located in the center of the town plaza; it is in a fine state of preservation.	Aztec civilization.
Catemaco	Veracruz	Sepulchres and the ruins of towns.	Mayan civilization.
Cerro de Guin-galo	Oaxaca	Extensive ruins.	Guavean civilization.
Coixtlahuaca	Oaxaca	Sepulchres	Mixtecan civilization.
Comalcalco	Tabasco	Ruins of edifices.	Aztec civilization.
Contla	Tlaxcala	Ruins of edifices.	Not well known.
Coscomatepec (See "San Juan Cos")	Veracruz		
Cataxtla	Veracruz	Diverse monuments.	Totonacan civilization.
Coxcatlan	Puebla	A monument known as "San-soanchi"; visitors exploring	Toltec civilization.

<i>Name and Location of the Ruins:</i>	<i>State:</i>	<i>What They Represent:</i>	<i>Ethnological Significance:</i>
Coxcatlan (<i>Cont.</i>)	Puebla (<i>Cont.</i>)	the place found an earthen jar filled with finger rings, earrings, beads and idols, all of solid gold and beautiful workmanship.	
Cuernavaca	Morelos	In the suburb of San Antón stands a rock into which an alligator and four points are carved. On lands of the old ranch of Basoco, almost within the city of Cuernavaca, there is a rock with a relief representing a round shield, a standard, five arrows and an animal's head, seemingly that of a tiger. An eagle is carved into another rock near the city of Cuernavaca.	Aztec civilization.
Cues (See "Los Cues")			
Cuicatlan	Oaxaca	Sepulchres and other ruins.	Mixtec civilization.
Cuilapa (See "Zachila")			
Cumuato (See "Hacienda de Cumuato")			

<i>Name and Location of the Ruins:</i>	<i>State:</i>	<i>What They Represent:</i>	<i>Ethnological Significance:</i>
Chalchihuites	Durango	Important ruins of a town.	Toltec civilization.
Chapala (See "Lago de Chapala")			
Charan	Michoacan	Ruins of edifices.	Tarascan civilization.
Chicualoque	Veracruz	The ruins of a town.	Totonacan civilization.
Chichen-Itza	Yucatan	Important ruins and a "cenote" (water deposit in a cavern), called "Sagrado."	Toltec civilization.
Chilon	Chiapas	Ruins of edifices.	Mayan civilization.
Cholula	Puebla	The base of a temple and several ruins of edifices.	Toltec civilization.
Chunmul	Quintana Roo	Ruins of edifices.	Mayan civilization.
Ejutla	Oaxaca	Ruins of edifices.	Zapotec civilization.
Elemax	Quintana Roo	Ruins of edifices.	Mayan civilization.
El Meco	Quintana Roo	The base of a temple made of rough stone and mortar.	Mayan civilization.
El Pueblito	Querétaro	In the vicinity of the city of Querétaro exists the base of a teocalli on which a Catholic church has been built.	Aztec civilization.
El Tajín	Veracruz	A famous pyramid surrounded by sepulchres.	Totonacan civilization.

<i>Name and Location of the Ruins:</i>	<i>State:</i>	<i>What They Represent:</i>	<i>Ethnological Significance:</i>
Es p i n a l, Paso del Correo	Veracruz	The ruins of a town.	Totonacan civilization.
E t l a	Oaxaca	Ruins of temples and sepulchres	Zapotecan civilization.
Frontera	Tabasco	In the vicinity of the town of Frontera there are ruins of teocallis, and at a distance of two kilometers, the base of a teocalli decorated with small bricks and a pyramid.	Aztec civilization.
Grutas de Zahuaripa	Sonora	Grottoes	The ethnology of these grottoes is unknown.
Guadalupe (See "Hacienda de Guadalupe")	Puebla		
H a c i e n d a de Burras	Guanajuato	Sepulchres.	Tarascan civilization.
H a c i e n d a de Cumuato	Jalisco	Several ruins	Tarascan civilization.
H a c i e n d a de Guadalupe, in the District of Huejotzingo	Puebla	Ruins of teocallis and sepulchres.	H u e j o t z i n c a n civilization.
Huatusco	Veracruz	Ruins of edifices.	Totonacan civilization.
Huitzo	Oaxaca	Ruins of temples and sepulchres.	Zapotecan civilization.
Isla de Sacrificios	Veracruz	Ruins of temples and sepulchres.	Totonacan civilization.
Itzimité	Yucatan	Ruins of edifices.	Mayan civilization.
Izamal	Yucatan	Ruins of a large Cyclopean pyramid.	Mayan civilization.

<i>Name and Location of the Ruins:</i>	<i>State:</i>	<i>What They Represent:</i>	<i>Ethnological Significance:</i>
Izamal (<i>Cont.</i>)	Yucatan (<i>Cont.</i>)	mid and of several temples.	
Jilotepec	Mexico	Large base of a temple on which a Catholic church has been built.	Otomi civilization.
Jonuta	Tabasco	Near the banks of the Uzumacinta river stands the large base of a teocalli.	Mayan civilization.
Kabaha	Yucatan	Ruins of edifices.	Mayan civilization.
Koba	Yucatan	Ruins of edifices.	Mayan civilization.
Labna	Yucatan	Ruins of wonderful palaces.	Mayan civilization.
Lago de Chapala	Jalisco	Ancient objects are found all along the shores of the lake.	Tarascan civilization.
Lago de Patzcuaro	Michoacan	There are several isles in this lake; ruins of temples and other edifices are found on the isle of Iguatzio; ruins of edifices and sepulchres on the isle of Janicho, and sepulchres on the isle Tzintzuntzan.	Tarascan civilization.
La Quemada	Zacatecas	Ruins of edifices, votive pyramids, large halls the roofs of which are supported by columns, an	Tarascan civilization.

<i>Name and Location of the Ruins:</i>	<i>State:</i>	<i>What They Represent:</i>	<i>Ethnological Significance:</i>
La Quemada (<i>Cont.</i>)	Zacatecas (<i>Cont.</i>)	extensive place for ball games, fortifications and dwellings. A relief representing seven snakes is sculptured in one of these ruins. These ruins go by the name of Chicomoztoc, meaning "seven caverns," and tradition has it that the seven tribes which populated Anáhuac started from these caverns. But no caverns are found there.	
León	Guanajuato	Idols and earthen jars have been found at the bottom of a spring situated on the "paseo" (walk) of the city.	Tarascan civilization.
Los Cues	Oaxaca	Many sepulchres.	Toltec civilization.
Macuba	Yucatan	Ruins of edifices.	Mayan civilization.
Malinalco, District of Tenancingo	Texcala	The ruins of a temple, a hill called "Los Idolos" and another hill known as "Tozqui-huac."	Aztec civilization.

<i>Name and Location of the Ruins:</i>	<i>State:</i>	<i>What They Represent:</i>	<i>Ethnological Significance:</i>
Maltrata	Veracruz	Different ruins and sculptured stones.	Aztec civilization.
Mayapan	Yucatan	This is the site of the ancient Mayan Capital; it shows ruins of edifices; the stela of Mayapan is embedded in the wall of one of the corridors on the Escanchacan estate, or hacienda.	Mayan civilization.
Meco (See "El Meco")	Quintana Roo		
Metlatoyucan and Mesa de Coroneles	Veracruz	Many very important monuments are found here.	Toltec civilization.
Mitla	Oaxaca	The ruins of an assemblage of edifices known under different names, such as "Columnas," "Arroyo," "Curato," "Fuerte," "Tierra Blanca," "Trapiche," "Pasacarrera"; a sepulchre on the hacienda of Xagú; the "Cueva del diablo" (the devil's cavern); a cruciform sepulchre and the ruins of a temple on	Toltec and Zapotec civilization

<i>Name and Location of the Ruins:</i>	<i>State:</i>	<i>What They Represent:</i>	<i>Ethnological Significance:</i>
Mitla (<i>Cont.</i>)	Caxaca (<i>Cont.</i>)	<p>the hill of Guirú on one side of the road to Tehuantepec; in this section are also located the quarries from which the stones were carried by the Indians about twelve miles away for the building of edifices at Mitla; in the town of Matatlan there are the ruins of edifices and sepulchres. In the towns of Teotitlan del Valle, Tlacoxahualla and Oaxaca many objects made of solid gold have been found in the sepulchres; between Mitla and Tlacolula there is a rock known as "Caballito Blanco" (little white horse) the upper part of which is decorated.</p>	
Moctezuma	Chihuahua	<p>On a hill are the ruins of concentric rings of fortifications made of stone;</p>	

<i>Name and Location of the Ruins:</i>	<i>State:</i>	<i>What They Represent:</i>	<i>Ethnological Significance:</i>
Moctezuma (<i>Cont.</i>)	Chihuahua (<i>Cont.</i>)	ruins of fortifications are also found on the steep rock of the hill, as well as the ruins of a very ancient town; the rocks show hieroglyphic paintings and the head of an idol.	
Naulinco	Veracruz	The ruins of a teocalli.	Totonacan civilization.
Nochistlan	Oaxaca	Ruins of a large town located on a hillock.	Mixtec civilization.
Nogales	Veracruz	Ruins of temples in grottoes.	Totonacan civilization.
Ocotlan	Oaxaca	Ruins of edifices.	Zapotec civilization.
Orizaba	Veracruz	Within the municipal cemetery there is a large carved rock known as "El Gigante" (the giant).	Aztec civilization.
Paalmul	Yucatan	Ruins of edifices.	Mayan civilization.
Palenque	Chiapas	Famous ruins.	Mayan civilization.
Panuco	Veracruz	Diverse monuments.	Probably of Mayan origin.
Paracho	Michoacan	Ruins of edifices and sepulchres.	Tarascan civilization.
Paraiso	Tabasco	Diverse ruins.	Aztec civilization.
Paso del Correo (See "Espinal")			
Patzcuaro	Michoacan	A large number of objects are	Tarascan civilization.

<i>Name and Location of the Ruins:</i>	<i>State:</i>	<i>What They Represent:</i>	<i>Ethnological Significance:</i>
Patzcuaro (<i>Cont.</i>)	Michoacan (<i>Cont.</i>)	buried in small sepulchres near the town.	
Piedras Pintas	Nuevo León	Important reliefs in the steep rocks of the hills.	Tarascan civilization.
Pueblito (See "El Pueblito") Quemada (See "La Quemada") Quiotepec	Oaxaca	On the summit of the hill near Quiotepec there are ruins of houses, temples and sepulchres, from which countless precious articles have been removed, especially necklaces made of white jasper and pieces of jasper in rough state.	Toltec civilization.
Ranas, Canoas	Querétaro	Ruins of edifices.	Aztec civilization.
Salagua, Bay of Manzanillo	Colima	Ruins of edifices and sepulchres.	Tarascan civilization.
Salinas de Zocalco	Jalisco	Various objects have been found here, among them a beautiful small idol of solid gold, on exhibition in the National Museum of the City of Mexico.	Tarascan civilization.
San Andres Tuxtla	Veracruz	Diverse monuments.	Mayan and Aztec civilization.

<i>Name and Location of the Ruins:</i>	<i>State:</i>	<i>What They Represent:</i>	<i>Ethnological Significance:</i>
San Carlos	Oaxaca	Ruins of edifices.	Toltec civilization.
San Juan Coscomatepec Tajin (See "El Tajin")	Veracruz	Ruins of temples.	Totoacan civilization.
Tanguanzicuario	Michoacan	Ruins of edifices and sepulchres situated fifteen miles from the city of Zamora.	Tarascan civilization.
Tecamachalco	Puebla	Diverse ruins.	Aztec civilization.
Tecolpa	Tabasco	Four bases of temples and other edifices.	Mayan civilization.
Tecomavaca	Oaxaca	Ruins of a very ancient town are located on the summit of a hillock in the vicinity of the village.	Mixtec civilization.
Teotihuacan	Mexico	Diverse monuments.	Toltec or Totonacan civilization.
Teotitlan del Camino	Oaxaca	Ruins in which precious objects of gold and jasper, and many-colored idols have been found.	Toltec civilization.
Tenancingo	Mexico	Ruins of edifices; a sculptured idol exists on the hill of "La Malinche" in the suburb of Tenancingo known as Alcatzingo.	Aztec civilization.
Tepeaca	Puebla	The ruins of a town at the foot	Aztec civilization.

<i>Name and Location of the Ruins:</i>	<i>State:</i>	<i>What They Represent:</i>	<i>Ethnological Significance:</i>
Tepeaca (<i>Cont.</i>)	Puebla (<i>Cont.</i>)	of the hill, known as "Viejo Tepeaca" (old Tepeaca).	
Texcoco	Mexico	In the vicinity are the ruins of various edifices; in a deep ravine near the village of Coatlinchan there is the largest idol known to exist in America called "La Zocaca"; the ravine is known as "Tepetitlan"; in Huexotla the ruins of several temples are found, as well as the famous walls mentioned by Hernan Cortez in his letters to the emperor Charles V; in the village of San Bernardino, in the district of Huexotla, are the ruins of various buildings. At Texcoco scarcely any traces of the ancient temples are left; about three miles from Texcoco is the hill of Texcut-	All these ruins are remnants of Acolhua civilization.

<i>Name and Location of the Ruins:</i>	<i>State:</i>	<i>What They Represent:</i>	<i>Ethnological Significance:</i>
Texcoco (<i>Cont.</i>)	Mexico (<i>Cont.</i>)	zingo, on the summit of which are remains of temples and other buildings, and a circular basin cut in the rock; on the border of this basin the image of a frog is carved in the rock. In the vicinity of Texcoco there is a hillock known as "El Gavilan" which holds important ruins; ruins of a town and of a large temple are located on the hill called "El Tlaloc" on the border line of the Valley of Mexico and Puebla.	
Tixcokob	Yucatan	Diverse ruins.	Mayan civilization.
Tlacotepec	Puebla	Diverse ruins.	Aztec civilization.
Tlalnepantla	Mexico	Three miles from this place is a teocalli, and on the slope of Barrientos, between Cuautitlan and Tlalnepantla a temple was discovered.	Aztec civilization.
Tlaxcala	Tlaxcala	Various ruins.	Tlaxcaltec civilization.

<i>Name and Location of the Ruins:</i>	<i>State:</i>	<i>What They Represent:</i>	<i>Ethnological Significance:</i>
Tonolá	Chiapas	Ruins of several buildings.	Mayan civilization.
Tula Hidalgo	Hidalgo	Here is a hill called "El Tesoro," on which there are the ruins of a town; on one side of this hill the image of a woman is sculptured in the solid rock.	Toltec civilization.
Tulun	Yucatan	Ruins of fortifications.	Mayan civilization.
Tuxpan	Guerrero	At a distance of three miles from the town of Iguala there are sepulchres and a teocalli.	Aztec civilization.
Tuxpan	Colima	Ruins of buildings and sepulchres.	Tarascan civilization.
Tuzapan	Veracruz	Various ruins and an idol four meters in height known as "Diosa del Agua" (Goddess of the Water), because tradition says that this goddess provides the water for the town.	Aztec civilization.
Uxmal	Yucatan	Diverse important ruins.	Mayan and Zapotec civilizations.
Ximalacatlan	Morelos	At a distance of eighteen miles from Tlaltec-	Toltec civilization.

<i>Name and Location of the Ruins:</i>	<i>State:</i>	<i>What They Represent:</i>	<i>Ethnological Significance:</i>
Ximalacatlan (<i>Cont.</i>)	Morelos (<i>Cont.</i>)	nango are ruins of temples and edifices.	
Xoxo (See "Zachila") Yautepec	Morelos	Rocks into which the images of enormous idols are carved.	Aztec civilization.
Zacapo, near Charan	Michoacan	Ruins of ancient towns; at the village of Charapa, 15 miles from Charan, there are ruins of sepulchres and buildings; sepulchres are also found at a place called Zacan, not far away from the others.	Tarascan civilization.
Zachila, Cuilapa and Xoxo	Oaxaca	Groups of temples and teocallis are found in these three places. Xoxo is located at a distance of 4 kilometers, Cuilapa 20 and Zachila 25 kilometers from the city of Oaxaca.	Zapotecan civilization.
Zahuaripa (See "Grutos de Zahuaripa") Zimatlan	Oaxaca	Ruins of buildings.	Zapotecan civilization.
Zoquitlan	Puebla	Ruins of an ancient town.	Toltec civilization.

APPENDIX II

ALPHABETICAL LIST OF THE PLANTS, FRUITS AND TREES OF COMMERCIAL OR INDUSTRIAL USE MENTIONED IN THE VARIOUS SECTIONS OF THIS BOOK

The common names indicated in this list are those under which the plants, fruits and trees are known in Mexico. It would be useless to try to give their English names, because most of them have no English equivalent. For this reason we have added the corresponding botanical terms.

There is a frequent repetition of the same name. This is due to the fact that the natives of the different sections of Mexico, and even those of the same section, have one name for various species of plants or trees. In such cases the botanical name will identify the species.

I.—Medicinal Plants

In a number of cases the therapeutical value of the plants indicated in this list is known to the Mexican physician, if not to the medical profession at large. These plants are employed for curative purposes by the native Indian, but their specific curative properties still have to be investigated and determined.

<i>Common name:</i>	<i>Botanical name:</i>	<i>Zone in which the plant grows:</i>
Abrojo	cactas	temperate
aconito	ranunculus dichotomus	temperate
adormidera	papaver somnifera	temperate
aguileña	aquilegia longissima	tropic
albahaca	ocymum basilicum	temperate
amapola (poppy)	papaver rhoeas	temperate
amapola	cenothera rosea	temperate
amapola amarilla	eschscholtzia californica	tropic
amapola morada	papaver atrupurpleum	temperate
anemona	anemone japonica	temperate
anemona	anemone mexicana	temperate
anisillo	tagetes micrantha	temperate
anisillo	schkukria virgata	temperate

<i>Common name:</i>	<i>Botanical name:</i>	<i>Zone in which the plant grows:</i>
arnica del país	hetherotheca inuloides	tropic
azafran (saffron)	lantana	temperate
Barbas de chivo	clematis dioica	temperate
borraja (borage)	borago officinalis	temperate
borraja	cordia boissieri	temperate
bruja	scholtzia californica	tropic
Caña fistula	cassia fistula	tropic
cañagria	rumex hymenoccephalus	tropic
cebadilla	schoenocaulon sp.	all zones
cerraja	taraxacum dens leonis	temperate
chachaca	grimis winteri	temperate
chia (sage)	salvia hispanica	temperate
chia cimarrona	salvis pseudo chia	temperate
chilillo	grimis winteri	temperate
cicuta	coniium maculatum	temperate
contrahierba	psarolea pentaphylla	all zones
copalxihuitl	myrica xalapensis	tropic
cuamacate	antoginon leptapus	temperate
cuasia de Jamaica	picroasma excelsa	tropic
cuetante	schkrankia aculeata	temperate
cundeamor	momordica charantia	tropic
Damiana	jurnera diffusa	tropic
damiana, or, hierba de San Nicolás	chisactinia mexicana	tropic
damiana de California	thurnera aphrodisiaca	tropic
drimis	grimis winteri	temperate
Espuelas de cabalero	delphinium leptophyllum	temperate
Floripondio	datura arborea	temperate
Gordolobo	guaphalium canescens	temperate
Haba de San Ignacio	hula crepitans	tropic
hierba buena (mint)	mentha rotundifolia	temperate
hierba del borracho	calamintha macrosthemata	tropic
hierba de la cucaracha	haplophitum cimididum	tropic
hierba del borrego	stevia eupatoria	tropic
hierba del zorillo	croton diocus	temperate
hinojo	foeniculum vulgare	temperate
hoja sen (senna)	fluorencia cernua	temperate
Jalapa (jalap)	spomoea purga	tropic
jojoba	simondsia californiana	tropic
Limoncillo	dalea citriodora	tropic
Madreselva (honey-suckle)	lonicera carpifolium	temperate

<i>Common name:</i>	<i>Botanical name:</i>	<i>Zone in which the plant grows:</i>
magnolia	magnolia grandiflora	tropic
malva prieta (mal-low)	abutilon sp.	tropic
malvavisco	sida carpinifolia	temperate
manzanilla (camo-mile)	matricaria chamomilla	temperate
manzanillo or max-che	hippomane mancinella	tropic
marihuana (Indian hemp)	cannabis indica	tropic
marrubio (white hore-hound)	marrubium vulgare	temperate
mirasol	cosmos bipinnatus	temperate
mostaza (mustard)	brassica nigra	temperate
mostaza cimarrona	brassica sinapistrum	temperate
Nacaxtle	pithocolobium sp.	tropic
naranjillo	ilex dugesii	tropic
nextamalxochil	ranunculus dichotomus	tropic
nispero	eriobobrya japonica	tropic
Oregano (wild marjoram)	lippia graveolens	temperate
oregano	brickella veronicaefolia	temperate
organo	cereus marginatus	tropic
ortiga (nettle)	urtica sp.	temperate
Pegarropa	mentzelia wrightii	temperate
peyote	lophophora williamsi	temperate
peyote cimarron	echinocactus myriosigma	temperate
pinguica	arctostaphyllus pungens	temperate
piñoncillo	jatropha curcas	tropic
poleo	mentha pulegium	temperate
Quina	cinchona succirubra	tropic
quina amarilla	excetemum sp.	tropic
quina falsa	excetemum caribaeum	tropic
Romero (rosemary)	rosmarnius officinalis	temperate
rosilla	helenium mexicana	temperate
rosilla	helenium automale	temperate
Salvia	buddleia perfoliata	temperate
sangre de grado	jatropha spatulata	temperate
sangre de toro	spigelia longiflora	tropic
Salvilla	buddleia scordioides	temperate
siempre viva	echeverria coccinea	temperate
Tabaquillo	cala mintha macros-thema	tropic
toloache	datura tatula	temperate

<i>Common name:</i>	<i>Botanical name:</i>	<i>Zone in which the plant grows:</i>
toloache	<i>datura stramonium</i>	temperate
toloache de laguna	<i>datura ceratocaula</i>	temperate
tomillo (thyme)	<i>thimus vulgaris</i>	temperate
toronjil	<i>cedronela mexicana</i>	temperate
toronjil	<i>dracocephalum moldavica</i>	temperate
Valeriana (valerian)	<i>valeriana mexicana</i>	temperate
Yerba buena (peppermint)	<i>mentha pipenta</i>	temperate
yerba buena	<i>mentha viridis</i>	temperate
yerbanis	<i>tagetes lucida</i>	temperate
yoloxochitl	<i>talauma mexicana</i>	tropic
yoyote	<i>thevetia nerrifolia</i>	tropic
Zabila	<i>aloe vulgaris</i>	temperate
zarzaparilla (sarsaparilla)	<i>smilex sp.</i>	tropic

2.—Industrial Plants

The plants indicated in the following list are of different industrial and commercial use, as is more clearly explained in the various chapters of this book. Some of these plants yield dye-stuffs, others tanning material, still others gums or resins, others again produce different grades of fiber, while from some vegetable oil, wax or rubber is extracted, etc.

<i>Common name:</i>	<i>Botanical name:</i>	<i>Zone in which the plant grows:</i>
Ajonjoli (sesame)	<i>sesamum indicum</i>	temperate
alcaparra	<i>spomea</i>	temperate
algodon (cotton)	<i>gossypium herbaceum</i>	tropic and subtropic
amole	<i>procnyanthes viridescens</i>	temperate
amole de bolita	<i>sapindus marginatus</i>	tropic
anilina	<i>phlox drumondi</i>	tropic
azafrancillo	<i>indigofera añil</i>	tropic
añil (indigo-plant)	<i>escobea linearis</i>	temperate
azafrancillo	<i>carthamus tinctorius</i>	temperate
Cabeza de viejo	<i>cephalocereus crisanthus</i>	tropic
cabeza de negro	<i>gonolobus sp.</i>	tropic
cacahuete (peanut)	<i>arachys hipogea</i>	temperate
cadillo	<i>xanthium canadensis</i>	temperate
candelilla	<i>euphorbia cerifera</i>	temperate
candelilla	<i>euphorbia antisiphilitica</i>	temperate

<i>Common name:</i>	<i>Botanical name:</i>	<i>Zone in which the plant grows:</i>
caña de azucar (sugar-cane)	saccharum officinarum	tropic and sub-tropic
caña japonesa	hipsacum latifolium	tropic
caña (hemp)	cannabis sativa	all zones
cañapis	sorghum vulgare	tropic
carrizo	arundo donax	all zones
cascalote	caesalpinia coriaria	tropic
cazuahuate	ipomea arborea	tropic
chicalote	argemone mexicana	temperate
chicalote	argemone platyceros	temperate
chachamole	nymphae ampla	temperate
clavellina	bombax palmeri	temperate
clavellina	pachira	tropic
coyol	attlea sp.	temperate
coyol real	oreodoxa regia	tropic
coyol baboso	acromia mexicana	temperate
cozticpatle	thalictrum hernandezii	tropic
cuajote	bursera aptera	tropic
cuaulote	heliocarpus americanus	temperate
Escoba (Spanish broom)	brickelia spinulosa	all zones
estafiate	artemisia mexicana	temperate
estropajos	luffa cylindrica	temperate
Gobernadora	larrea mexicana	temperate
guapilla	agave falcata	tropic
guayule	parthenium argentatum	temperate
Henequen (sisal hemp)	agave rigida	tropic
higuerilla (castor-oil plant)	ricinus communis	all zones
hoja pinta	samsevieria zeylandica	tropic
Ixtle	agave sp.	all zones
izote	yucca sp.	tropic
Jinote	heliocarpus americanus	temperate
Lagrima de San Pedro	caix lachryma	tropic
lechuguilla	agave heterocantha	temperate
lentisco (lentiscus)	forrestiera phillyroides	temperate
linaloe	bursera aloexylon	tropic
linaza (flax)	linum usitatissimum	temperate
lirio acuatico	eichornia crascipens	temperate
lirio azul	iris germanica	temperate
Maguey	agave sp.	all zones
maguey bravo	agave cupreata	tropic
maguey bruto	agave asperrima	temperate

<i>Common name:</i>	<i>Botanical name:</i>	<i>Zone in which the plant grows:</i>
maguey del cerro	agave asperuna	temperate
maguey del pulque	agave atrovirens	temperate
maguey pinto	agave picta	tropic
maguey verde	agave complicata	temperate
marañon (cashew)	anacardium occidentale	tropic
moral	cholophora (tinctoria)	tropic
morera	morus latifolia	temperate
morera	morus albi	temperate
mosqueta	philladelphus coronarius	tropic
Napahuite	trichilia hirta	tropic
ninfa	nymphaea ampla	temperate
ninfa	nymphaea elegans	temperate
ninfa blanca	birsonima crassifolia	temperate
ninfa, or, cabeza de negro	nymphaea gracilis	tropic
nopal de la cochinitilla	nopalea coccinelifera	tropic
Ocotillo	fouquiera splendens	temperate
ojaranza	carpinus betulus	temperate
orchilla	roccella tinctoria	tropic
otate	guada sp.	tropic
otatillo	chusquea sp.	tropic
Pajon	sporobolus wrightii	temperate
pajon	epicampes macroura	temperate
palma	yucca filamentosa	temperate
palma	samuella carnerosana	temperate
palma	brahea dulcis	tropic
palma	yucca australis	tropic
palma de San Pedro	yucca descipiens	tropic
palma jipi	carludovica palmata	tropic
palma samandoca	yucca australis	temperate
pata de liebre	ochroma lagopus	tropic
pie de cabra	bauhinia sp.	tropic
pita	ananas macrodontes	tropic
pochote	eriodendron grandiflora	tropic
pochote	eriodendron aesculi-forme	tropic
Ramie	boehmeria niveatex	tropic
Tabaco (tobacco)	nicotiana tabacum	tropic and subtropic
torote	bursera microphylla	tropic
tule	thipha angustifolia	temperate
tule	cyrpus lacustris	temperate
tule	tipha dominguensis	tropic
tulillo	eleocharis palustris	temperate

<i>Common name:</i>	<i>Botanical name:</i>	<i>Zone in which the plant grows:</i>
tulillo	<i>cyperus melanos tachius</i>	temperate
Zacate de escoba	<i>sporobolus utilis</i>	temperate
zacate de escoba	<i>muhlenbergia distichophylla</i>	temperate
zacaton	<i>epicampes macroura</i>	temperate
zapupe	<i>agave derveyana</i>	tropic

3.—*Edible Plants*

The following is a list of plants used as edibles by the Mexican people. Some of these plants are generally known, others belong to tropical America, while others are specifically Mexican. All the species of vegetables growing in the temperate zone are also cultivated in Mexico.

<i>Common name:</i>	<i>Botanical name:</i>	<i>Zone in which the plant grows:</i>
Ajo (garlic)	<i>allium sativum</i>	all zones
alcachofa (artichoke)	<i>cynara scolymus</i>	all zones
alverjon (common vetch)	<i>pisum sativum</i>	temperate
apio (celery)	<i>apium graveolens</i>	temperate
arroz (rice)	<i>oryza sativa</i>	tropic and sub-tropic
avena (oats)	<i>avena sativa</i>	all zones
Betabel (beet)	<i>beta vulgaris</i>	all zones
Cabbage	<i>brassica oleracea</i>	all zones
calabaza (calabash)	<i>cucurbita maxima</i>	all zones
calabaza de castilla	<i>cucurbita pepo</i>	all zones
camote (sweet potato)	<i>ipmoea batatas</i>	all zones
cebada (barley)	<i>hordeum sativa</i>	temperate
cebolla (onion)	<i>allium cepa</i>	all zones
chayote	<i>sechium edule</i>	all zones
chicharo (pea)	<i>pisum sativum</i>	all zones
chilacayote	<i>cucurbita ficifolia</i>	all zones
chile bolita (chilli)	<i>capsicum cordiforme</i>	all zones
chile guajilla	<i>capsicum longum</i>	all zones
chile piquin	<i>capsicum annum cerasiforme</i>	all zones
colinabo (turnip)	<i>brassica oleracea</i>	all zones
Frijol (common bean)	<i>phaseolus vulgaris</i>	all zones
Garbanzo (garavance or chickpea)	<i>cicer arietinum</i>	all zones

<i>Common name:</i>	<i>Botanical name:</i>	<i>Zone in which the plant grows:</i>
guacamote or yuca (yuca)	manihot utilisima	tropic
Haba (large bean)	vicia faba	all zones
Ixpengua	dioscorea convolvulacea	tropic
Jicama	dahlia coccinea	temperate
jicama de agua	pachyrhizus tuberosus	tropic
jinicuil	inga jinicuil	tropic
Lechuga (lettuce)	lactuca sativa	all zones
lenteja (lentil)	lens aesculenta	all zones
Madre del maiz	dioscorea convolvulacea	tropic
maiz cuarenteño (corn)	zea mays precox	all zones
maiz de elote colorado	zea mays erythrolepsis	all zones
maiz de grano vestido	zea mays criptosperma	tropic
maiz de humedo	zea mays autumnna seminibus albi	all zones
maiz de riego	zea mays turgida	all zones
maiz palomero	zea mays minima	all zones
melon	cucumis	temperate
Nabo (turnip)	brassica napus	all zones
ninfa	nymphaea mexicana	temperate
Papa (Irish potato)	solanum tuberosum	all zones
pepino (cucumber)	cucumis sativus	all zones
pimiento	capsicum pubescens	tropic
Rabano (radish)	raphanus sativus	all zones
romeritos	suaeda torreyana	temperate
Tomate (tomato)	physalis peruviana	all zones
tomatillo	physalis angulata	all zones
trigo (wheat)	triticum sativum	cold and temperate
Vainilla (vanilla), used for flavoring	vanilla planifolia	tropic
verdolaga (purslane)	jussiaea repens	temperate
verdolaga	portulaca oleracea	temperate
Xaan or palma comun	phoenix datilifera	tropic
Yuca (yuca)	manihot palmata aipi	tropic
Zanahoria (carrot)	daucus carotta	all zones

4.—Fodder Plants

This list comprises the various species of fodder plants growing in the different sections of Mexico; particular reference is made to these plants in the chapter on Live-stock Raising.

<i>Common name:</i>	<i>Botanical name:</i>	<i>Zone in which the plant grows:</i>
Alfalfa	medicago sativa	temperate
alfalfa arbusto	medicago arborea	temperate
aceitilla	bides leucantha	temperate
camelote	ophismemmis holciformis	temperate
engordacabras	dalea tuberculata	cold
grama (creeping cynodon)	cynodon dactylon	all zones
te blanco	bidens leucantha	temperate
te de milpa amarillo	bidens tetragona	temperate
trebol (clover)	trifolium amabile	temperate
trebol	molulotus parviflora	temperate
trebol	trifolium involucratum	temperate
trebol de carretilla	medicago denticulata	temperate
zacate borreguero	bouteloua oligostachya	temperate
zacate camalote	panicum crus-galli	temperate
zacate cola de zorra	muhlenbergia affinis	all zones
zacate colorado	trachypogon polymorphus	all zones
zacate de agua	andropogen macrourus	all zones
zacate grama	paspalum distichum	all zones
zacate liendrilla	muhlenbergia implicata	all zones

5.—Ornamental Plants

This list includes just a few of the ornamental plants found in the Mexican gardens and homes. In the forests, especially in the tropical forests of Mexico, there is an immense variety of plants and trees of extraordinary beauty.

<i>Common name:</i>	<i>Botanical name:</i>	<i>Zone in which the plant grows:</i>
Cantua	cantus busifolia	temperate
nardo (spike nard)	polianthes tuberosa	tropic
palma	livistonia australis	tropic
palma	phoenix canariensis	tropic
palma	livistonia chinensis	tropic
palma de las pampas	grinerium oleander	tropic
palma real	roystonea regia	tropic
palmera	prichardia phillifera	tropic

Fruits

<i>Common name:</i>	<i>Botanical name:</i>	<i>Zone in which the fruit is produced:</i>
Aguacate (alligator-pear)	persea gratissima	tropic
aguames	bromelia pinguin	temperate
anona	anona squamosa	tropic
arbol de pan	artocarpus incisa	tropic
bonete	echinocactus myrios-tigma	temperate
bonete	pileus heptaphyllus	tropic
bonete	jacaratra mexicana	tropic
cacao	theobroma cacao	tropic
café (coffee)	coffea excelsa	tropic
capomo	brossium alicastrum	tropic
capulin	prunus capuli	temperate
cardon	cereus pecten aboriginus	temperate
cerezo (cherry)	prunus cerasus	temperate
ciruela (plum)	prunus domestica	tropic
ciruela	spondias purpurea	tropic
ciruela	spondias lutea	tropic
coco (coconut)	cocos nucifera	tropic
coquito de aceite	atalea cohune	tropic
chamal	dioon edule	temperate
chavacano	prunus armeniaca	temperate
chicozapote	achras sapote	tropical
chirimoya	anona squamosa	tropical
chirimoya (cheri-moyer)	anona cherimollia	tropical
cuapinole	hymenaea courbaril	tropic
datil (date)	poenix datilifera	tropic
datil cimarron	agave sp.	tropic
frambuesa (raspberry)	rubus edoeus	temperate
fresa (strawberry)	fragaria vesca	temperate
garambullo	cereus geometrizans	temperate
granada (pomegranate)	punica granatum	temperate
granadilla	mocina heterophylla	temperate
granadita de china	passiflora edulis	tropic
granjeno	celtis pallida	temperate
guamara	bromelia pinguin	tropic
guanabana (custard apple)	anona muricata	tropic
guasima	guazuma polibotrya	tropic
higo (fig)	ficus carica	temperate

<i>Common name:</i>	<i>Botanical name:</i>	<i>Zone in which the fruit is produced:</i>
huamuchil	pitecolobium dulce	tropic
jarrilla	mocinna heterophylla	temperate
jicama	dalea coccinea	temperate
jicama de agua	pachyrhizus tuberosus	tropic
jinicui	inga jinicuil	tropic
jojoba	simondsia californiana	tropic
lima (lime)	citrus limetta	tropic
limon (lemon)	citrus limonum	tropic
macallo	andira excelsa	tropic
malon zapote	carica papaya	tropic
mamey (mammee)	lucuma mammosa	tropic
mamey silvestre	mammea sp.	tropic
mangle	rhizophora mangle	tropic
mangle prieto	conocarpus erecta	tropic
manzana (apple)	pyrus malus	temperate
membrillo (quince)	sydonia vulgaris	temperate
morera (blackberry)	morus nigra	temperate
nanche	birsonima crassifolia	temperate
naranja (orange)	citrus aurantium	tropic
nogal (nut)	juglans rupestris	temperate
nogal de nuez grande	juglans regia	temperate
nogal de nuez chica	carya oliviformis	temperate
nopal de castillo	opuntia ficus indica	temperate
nopal duraznilla	opuntia leucotricha	temperate
olivo (olive)	olea europea	temperate
papayo (papaw)	carica papaya	tropic
papayo	papaya prolifera	tropic
parota	enterolobium ciclocarpum	tropic
parra (grape)	vitis vinifera	subtropic
parra silvestre	vitis aestivalis	temperate
peral (pear)	pyrus communis	temperate
peyote	lophophora williamsi	temperate
piche	enterolobium ciclocarpum	tropic
piña (pineapple)	ananas sativa	tropic
piña	bromelia ananas	tropic
pitahaya	cereus tricoloratus	tropic
pitahaya	cereus variabilis	tropic
platano chino	musa paradisiaca	tropic
platano morado	musa rosacea	tropic
platano tabasco (banana)	musa regia	tropic
tamarindo (tamarind)	tamarindus indicus	tropic

<i>Common name:</i>	<i>Botanical name:</i>	<i>Zone in which the fruit is produced:</i>
tejocote	crataegus mexicana	temperate
toronja (grapefruit)	citrus decumana	tropic
zapote amarillo	lucuma salicifolia	tropic
zapote blanco (sapota)	casimiroa edulis	tropic
zapote prieto	diospyrus ebenaster	tropic
zapotillo or ziziacche	achras sapote	tropic

Timber

<i>Common name:</i>	<i>Botanical name:</i>	<i>Zone in which the tree grows:</i>
Abedul (birch-tree)	betula verrucosa	temperate
abeto (silver-tree)	abies religiosa	cold
acahuite	pinus ayacahuite	cold
acocote	lagenaria vulgaris	temperate
acocote	prionosciadum mexicana	tropic
acebuche	forrestiera mureoides	tropic
aguacatillo	persea gratissima	tropic
ahuate or latanillo	ruprechtia cumingii	tropic
ailé	alnus sp.	temperate
ailé	alnus acuminata	temperate
alamillo	populus tremuloides	cold
alamo (poplar)	populus monilifera	temperate
alamo	populus canadiensis	temperate
alampepe	entada scandens	tropic
algodoncillo	inga sp.	tropic
alisco (alder-tree)	alnus glabrata	temperate
amate	ficus nymphaefolia	tropic
amapa	tabebuia sp.	tropic
amapola or chucte	myroxylon pereirae	tropic
aquistle or codo de fraile	thevetia nerrifolia	tropic
arbol de fuego	pinciana regia	tropic
arbol de hule (rubber-tree)	castilloa elastica	tropic
arbol de Judas	baconica arborea	tropic
arce (maple-tree)	acer campestre	temperate
arrayan	myrtus arrayan	tropic
Balsamo (balsa m-tree)	myroxylon pereirae	tropic
bari	cordia gerascanthoides	tropic
bejuco colorado	hippocratea sp.	tropic

<i>Common name:</i>	<i>Botanical name:</i>	<i>Zone in which the tree grows:</i>
boochic or uvero	cephalanthus occidentalis	tropic
brasilete	caesalpinia brasiliensis	tropic
Cacahuananche	licania arborea	tropic
cahua or palo Maria	achras sp.	tropic
camichin	ficus fasciculata	tropic
caniste	lucuma mammosa	tropic
cantemo	acacia filicina	tropic
caoba	swietenia mahogani	tropic
capomo	brosimum alicastrum	tropic
capulin	rhus virens	tropic
cascap	inga sp.	tropic
catalox or lloa sangre	bocconia arborea	tropic
caucho (rubber-tree)	castilloa elastica	tropic
caucho	ficus elastica	tropic
cazin or bejuco colo- rado	hippocratea sp.	tropic
cedro (cedar)	cupressus benthianiana	cold
cedro rojo	cedrela glaziovii	tropic
cedro del Himalaya	cedrus deodora	cold
cedro	cedrela odorata	cold
ceiba	eriodendron occidentale	tropic
cepillo del diablo	cumbretum jacquini	tropic
cepillo del diablo	cumbretum laxum	tropic
ciprés (cypress)	cupressus sempervirens	cold
clavellina	pachira	tropic
cocoite	robinia sp.	tropic
cocomelca	smilax rotundifolia	tropic
colorin	erhytrina corallodendron	tropic
colorin chiquito	rhinchosia precatoria	tropic
copal chino	bursera bipinnata	tropic
copal santo	bursera jorullensis	tropic
copal poom	cyrtocarpia procera	tropic
copalchi	coutarea latifolia	tropic
copalquin	croton tiglium	tropic
copte-siricote	cordia dodecandra	tropic
criptomeria	criptomeria japonica	temperate
cueramo	cordia boissieri	tropic
cuajilote	parmentieri edulis	temperate
cuajote	bursera aptera	tropic
cuapinole	hymenaea courbaril	tropic
culinche	cedrela mexicana	cold
culiniche	bursera bipinnata	tropic
chacah	bursera gumifera	tropic

<i>Common name:</i>	<i>Botanical name:</i>	<i>Zone in which the tree grows:</i>
chacsinkin	caesalpinia pulcherrima	tropic
chamal	dioon edule	temperate
chante	ariocarpus fissuratus	temperate
chantecoc	brosium alicastrum	tropic
chaparro prieto	mimosa sp.	temperate
chaquicox	quercus virens	cold
chichen	hippomane mancinella	tropic
chicozapote	achras sapote	tropic
chijol	piscidia erytrina	tropic
chilte	manihot foetida	tropic
chintoc	hymenaea sp.	tropic
Divi-divi	caesalpinia coriariis	tropic
dracena	dracena indivisa	temperate
durillo	viburnum tinus	temperate
ebano (ebony)	diospyros ebenaster	tropic
ebano veteado	diospyros velutina	tropic
ebano mulato	calliandra formosa	tropic
encino (oak)	quercus	cold
encinilla	croton dioicus	cold
evónimo	evonimus japonica	temperate
eucalipto (eucalyptus)	eucalyptus globulus	temperate
frijolillo	ecacia berlandieri	tropic
Garabato	pisonia hirsuta	temperate
gateado colorado	swietenia humilis	tropic
gatuño	mimosa biuncifera	temperate
granadillo	pithocolobium multiflorum	tropic
granjeno	celtis pallida	temperate
grevilia	grevilea robusta	temperate
guaje	lagenaria vulgaris	temperate
guamara	bromelia pinguin	temperate
guasima	guazuma polibotrya	tropic
guayacan	guaiacum sanctum	temperate
guayacan	curiacum	temperate
guayacan colorado	tabebuia guayacan	temperate
guayo	melicocca bijuga	tropic
guayul	vauquelia corymbrosa	temperate
guindo-guayabillo	cerasus caproniana	tropic
Hobo	spondias lutea	tropic
huisache	acacia tortuosa	temperate
huisache	acacia albicans	temperate
Jabin or tuzohe	piscidia erytrina	tropic
jaboncillo	sapindus sp.	tropic
jaboncillo	sapindus drumondi	tropic

<i>Common name:</i>	<i>Botanical name:</i>	<i>Zone in which the tree grows:</i>
jarilla	senecio vernus	temperate
jotlatía	jotlatia	tropic
Laurel	laurus cerasus	temperate
laurel	litsea glaucescens	temperate
lentisco	forrestiera phillyroideas	temperate
limoncillo	dalea citriodora	tropic
linaloe	bursera aloexylon	tropic
Macallo	andira excelsa	tropic
madroño (straw-tree)	arctostaphyllus tomentosa	cold
magnolia	magnolis grandiflora	tropic
majagua	hibiscum tiliacens	tropic
mamey (mammee)	lucuma mammosa	tropic
manta	caesalpinia sp.	tropic
manzanillo	hippomane mancinella	tropic
maxche	hippomane mancinella	tropic
mangle prieto	conocarpus erecta	tropic
mangle rojo	rhizophora mangle	tropic
mezquite (mesquit)	prosopis juliflora	temperate
mezquitillo	cassia occidentalis	temperate
mimbre	chylopsis saligna	temperate
moral	chlophora tinctoria	tropic
morera (black mulberry tree)	morus nigra	temperate
morera	morus latifolia	temperate
mulato	celtis berlandieri	tropic
Navía	caesalpinia sp.	tropic
nazareno	brosium alicastrum	tropic
nogal (walnut-tree)	juglans regia	temperate
nogal	carya oliveaformis	temperate
nogal	juglans rupestris	temperate
ocote (fir-tree)	pinus teocote	cold
olmo (elm-tree)	olmus campestris	temperate
oyamel (sacred fir-tree)	abies religiosa	cold
Palo blanco	celtis berlandieri	temperate
palo blanco	ipomaea murocoides	tropic
palo blanco	celtis occidentalis	temperate
palo blanco	forrestiera phyllycoides	temperate
palo blanco	lysiloma candida	tropic
palo amarillo	berberis pinnata	tropic
palo brea	circidius unijuga	tropic
palo colorado	quercus virens	cold
palo de acro	tecoma stans	tropic
palo de fierro	brya ebenus	tropic

<i>Common name:</i>	<i>Botanical name:</i>	<i>Zone in which the tree grows:</i>
palo de rosa	tecoma multiflora	tropic
palo dulce	eysenhardtia sp.	tropic
palo del brasil	caesalpinia boreale	tropic
palo verde	parkinsonia torreyana	tropic
palo mulato	simaruba sp.	tropic
palo mulato	celtis berlandieri	temperate
palo de rosa amarilla	cachlospermum hibiscoides	tropic
paraiso or lila	melia azederach	temperate
parota	enterolobium cyclocarpum	tropic
peine de mico	apeiba tibourbou	tropic
peru	schinus molle	temperate
piche	enterolobium cyclocarpum	tropic
pinabete (fir-tree)	abies religiosa	cold
pino de azucar	pinus lambertia	cold
pino real (pine)	pinus montezumae	cold
pino real	pinus pseudostrobus	cold
pino triste	pinus lumholtzii	cold
pino corcho	pseudotsuga douglasii	tropic
piñon	pinus cembroides	cold
piñon	pinus osteoperma	cold
piñoncillo	jatropha curcas	tropic
pochote (cotton-tree)	eriodendron grandiflora	tropic
pochote	eriodendron aesculiforme	tropic
poom or copal	cyrtocarpia procera	tropic
propiste	candomina sp.	tropic
pucté	terminalia buceras	tropic
Quebracho	copaifera	tropic
quiebra hacha	hymenaea sp.	tropic
Ramon blanco	trophis americana	tropic
retama	cassia laevigata	temperate
roble (oak)	quercus macrophilla	temperate
rosadillo amarillo	cedrela sp.	tropic
Sabino	juniperus mexicana	temperate
sabino	taxodium mucronatum	temperate
saucó	sambucus nigra	temperate
sarache	excetemum sp.	tropic
sicomoro	acer platanooides	temperate
sophora	sophora japonica	temperate
Tamaris	tamaris plumosa	temperate
tamay or tamarindo	tamarindus indicus	tropic
taray de rio	salix taxifolia	temperate

<i>Common name:</i>	<i>Botanical name:</i>	<i>Zone in which the tree grows:</i>
taray or vara dulce	eysenhardtia orthocarpa	temperate
táscate	juniperus virginiana	cold
tepehuaie	acacia sp.	tropic
tepehuaie	lysiloma acapulcensis	tropic
téposan	buddleia humboldtiana	temperate
tescalama	ficus sp.	tropic
tezota or tepemezquite	prosopis sp.	temperate
torote	bursera microphylla	tropic
troeno	ligustrum japonica	temperate
tuya	thuya gigantea	temperate
tuzohe	piscidia orytrina	tropic
Valama	vitex mollis	tropic
vara prieta	caesalpinia gracillis	tropic
Xanxenero	acacia sp.	temperate
Yac or chicozapote	achras sapote	tropic
yoloxochitl	talauma mexicana	tropic
Zacocon	tabebuia guayacan	temperate
zalate	ficus sp.	tropic
zapote prieto	diospyros ebenaster	tropic
zapotillo	achras sapote	tropic
zempasuchil	tagetes erecta	tropic
ziziacche	achras sapote	tropic
zopilote	swiestenia mahogani	tropic
zubinche	brya ebenus	tropic

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